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OF THE

UNIVERSAL MEDICAL SCIENCES

A YEARLY REPORT OF THE PROGRESS OF THE GENERAL SANITARY SCIENCES THROUGHOUT THE WORLD.

EDITED BY

CHARLES E. SAJOUS, M.D.,

AND

SEVENTY ASSOCIATE EDITORS,

ASSISTED BY

OVER TWO HUNDRED CORRESPONDING EDITORS, COLLABORATORS, AND CORRESPONDENTS.

Illustrated with Chromo-Lithographs, Engravings and Maps.

VOLUME III.

1893.

London:
F. J. REBMAN,
11, ADAM STREET, STRAND.

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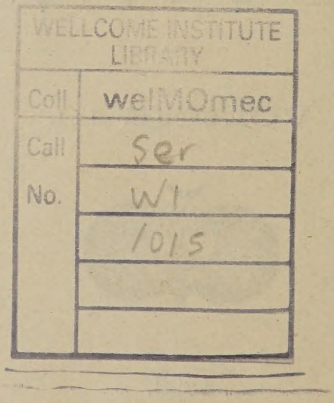

Philadelphia, Pa., U. S. A.
The Medical Bulletin Printing House,
1916 Cherry Street.

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SURGERY OF THE BRAIN SPINAL CORD, AND NERVES.

By LEWIS S. PILCHER, A.M., M.D.,
BROOKLYN,
AND
SAMUEL LLOYD, B.S., M.D.,
NEW YORK.

SURGERY OF THE BRAIN.

HISTORICAL.

Wyman, of Detroit, [234 Jan.] has studied the question of prehistoric trephining in connection with a skull which was removed from a mound on the Detroit River, and which gave evidence of having thus been operated upon. Skulls similarly treated have been found in various parts of Europe and in South America, as well as in several parts of the United States. A tribe in Algeria (the Kabyles), supposed to be descended from the Phœnicians, still practice trephining for fractures. Two theories have been suggested to explain these openings in the skulls. First, that it was a religious rite, and was performed post-mortem. The objection to this is that more of them are not found, and that some of the skulls that have been exhumed give distinct signs of cicatrization having taken place. The other theory is that it is a true surgical trephining, in substantiation of which Broca, as a result of his investigations, stated that trephining had been employed by some of these people as a remedy for internal diseases. The openings give evidence of having been done with much skill, and it is supposed that a species of lava, which is in reality a natural glass and called obsidian, was used. The Kabyles employ a razor, a serpette, one or two saws, some straight and curved elevators, and the burin, or perforator. The perforator is twirled between the hands until the bone is perforated, and these holes are made around the portion to be removed, when the openings are united by the saws and lifted out by the elevator.

INDICATIONS FOR THE USE OF THE TREPHINE.

Briggs, [120] Aug. in an article on compression of the brain and the province of the trephine, says that when pus is localized it should be evacuated, providing this can be accomplished without too much injury to the surrounding structures; when compression is increasing and is due to properly-localized blood-clot; when a foreign body has entered the skull and lodged in the brain, the trephine should be employed; but to operate for the relief of symptoms referable to depressed fragments of bone is entirely useless, although if the injury be local, confined to the bone itself, or extending but slightly beyond it, and rough splinters are pressing on the membranes and on the brain, perhaps lacerating them, the trephine is demanded.

In compound comminuted fractures, whether accompanied with symptoms or not, the trephine should be employed, but it is contra-indicated in simple fractures.

Gray, of New York, [98] Jan. advises operation upon the brain in cases of removable tumors, fracture, and meningeal hæmorrhage, abscess, epilepsy caused by localizable and removable lesions, and in cases of idiocy in which there is a history of arrest of development, probably due to premature ossification of the fontanelles. Lanphear, of Kansas City, [1076] Jan. discusses this subject from a personal experience of twenty-three cases, not including accidental injuries, such as gunshot wounds, fracture, etc. He reports two cases, one his own, the other operated upon by Parsons, where hæmorrhage from the middle meningeal artery followed upon an injury to the skull. A clot was evacuated and the hæmorrhage stopped. In hæmorrhage into the substance of the brain, the tissues are often simply pushed apart, without serious laceration of the tracts or destruction of tissue, and, if the clot be removed early, permanent injury may be prevented. In this connection he reports the case of a physician who had a subdural hæmorrhage and a softening of the arm-centre, in which recovery followed the removal of the clot. Brain-tumor should be removed, if it can be located, even though the relief be only transitory. Cephalalgia, resisting all medicinal measures, should be trephined, and general paresis in its first stage might be benefited. In insanity due to intra-cranial growths, the indications are always to operate. Epilepsy is still *sub judice*,—he has operated only once without suc-

cess,—but he would repeat operation in Jacksonian epilepsy. Tubercular meningitis is not benefited by operation, and microcephalus cannot yet be considered unsuitable for operation. In cases of premature closure of the skull, craniotomy is not only justifiable, but promises success in a moderate percentage of cases. A case operated upon by him died of shock in forty-two hours.

Kirchoff $^{116}_{\text{June}}$ says that three groups of symptoms are to be distinguished in every brain-abscess: 1. Those symptoms dependent upon suppuration, as fever, etc. 2. Those dependent upon the increase of intra-cranial pressure. 3. Those symptoms which arise at the seat of the abscess.

The cranium should never be opened, upon mere supposition, for the relief of this condition. The operation for the removal of brain-tumor has given but few good results; only encapsulated tumors should be removed. All infiltrating brain-tumors which occupy the important regions of the brain should be allowed to remain. Operation for epilepsy should be performed in those cases where the symptoms indicate cortical lesion, as in Jacksonian epilepsy. For hernia cerebri, von Bergmann recommends ligation of the protruding mass. In cases of tumors of the posterior part of the cranium, only small meningoceles should be operated upon. Draining the cavity of the cranium for serous effusion in tubercular meningitis has been found to relieve the pain or headache only temporarily. Puncturing the cranium for chronic hydrocephalus has been done since the days of Hippocrates, but no permanent cures have been reported. Craniotomy for microcephalus has been performed many times, and apparently with good results, but the operation is of too recent origin to report positively. Trephining for headache should only be done in those cases where there is a localized, obstinate pain. This may be due, in some cases, to pressure of a Pacchionian granulation.

Tauber $^{336}_{\text{May 21}}$ considers that the reasons for failure in replacing the removed bone in operative cranial defects are that the implanted disc does not remain on the level with the skull, but falls down upon the dura, and the edge of the plate does not fit against the edge of the cavity. In order to overcome these difficulties, he has constructed an instrument which he calls a tome-trephine.

Rajasingham $^{2}_{\text{Sept. 10}}$ has modified the trephine, the advantages of the new instrument being as follow: 1. The trephine has a nut,

and can be made to cut to any depth required. 2. The nut would tend to keep the trephine upright, so that the instrument would cut to an equal depth all round. 3. The position of the nut would give an exact indication of the depth to which the instrument has reached at any moment. 4. There would be no possibility of the trephine penetrating the brain or its membranes by any unlooked-for accident during the operation. 5. There is no centre screw in the handle for fixing it to the trephine, and thus there is no chance of the handle causing any uncomfortable pressure in the middle of the palm, and thus fatiguing the hand of the operator. The grasping and rotating power of the hand is thus much increased. 6. Even if the trephine did not possess the above advantages, it cannot do any harm.

Laplace, of Philadelphia, $\frac{99}{\text{July 7}}$ in a paper read before the American Medical Association, said that the three fossæ of the skull were separate and on a different plane from one another, but each could be reached by trephining. For the anterior fossa, the trephine should be applied immediately above the supra-orbital arch, at its junction with the temporal ridge. The dura can be separated by malleable platinum-wire instruments, flat and wedge-shaped, which can be gently pushed over the rough surface of the skull, and reach all parts of the floor of the fossa. For the middle fossa, the trephine should be applied on a line extending from the middle of the zygomatic process to the external angular process of the frontal bone.

For the posterior fossa, the trephine should be applied immediately above the external occipital crest to the right or to the left. This will expose the cerebellum below the lateral sinus. All these operations were successfully performed upon dogs. The chief advantage is thorough scientific drainage in cerebral injuries. Hæmorrhage should be controlled by packing with iodoform gauze, or gnawing off the edge of the bone and applying the hæmostatic forceps. He cited the case of a boy in illustration of the principles outlined.

TUMORS AND CYSTS.

Von Bramann $\frac{336}{\text{Aug. 13}}$ reported two cases of extirpation of cerebral tumors, both spindle-celled sarcomata. Seydel, in the discussion following the report of these cases, said that he had made an examination of 8488 histories in the Bollinger Pathological Insti-

tute, in order to obtain 100 tumors of the brain for comparison with the tables of White and Starr. Out of these 100 cases he found 27 tubercular, 39 sarcoma, 9 gliosarcoma and glioma, 2 cysticercus, 3 cholesteatoma, 2 cysts, 2 carcinoma, 2 psammoma, 6 syphilis, 1 actinomycosis, and in 16 the character of the tumor was not mentioned. Out of the 27 cases of tubercle none were operable; out of the 39 cases of sarcoma, two were properly diagnosticated some time before death, and might have been treated by operation. The cases of cysticercus and actinomycosis were centrally located and, consequently, inoperable. The carcinomata might have been extirpated, but they were metastatic. Of the 2 cases of cyst, 1 was multiple and the other involved the entire hemisphere. Of the psammoma, 1 was central, the other was only accidentally discovered in a man of 77. The cholesteatoma was inoperable. Out of the 16 unclassified, only 1 came within the possibility of surgical interference; so that out of the 100 only 3 were operable. Hall White found 7 out of the 100, and Starr 16 out of 300.

Czerny reported at the same time the case of a man, 40 years of age, who had had for ten years headache, weakness of the right arm, and, later, paresis of the right leg and epileptiform attacks. A diffuse gliosarcoma was found, all of which could not be extirpated, but, nevertheless, the result was remarkably good, the convulsions disappearing, and the man being able to return to work. A second operation was necessitated by the return of the symptoms, and ten or eleven centimetres of cortex were removed. A cyst was formed in this part of the brain. Only a weakness of the right arm persisted after this operation. Erb, $\frac{2}{\text{July 9}}$ in an almost identical case, of a man aged 47, who had clonic convulsions affecting the left arm and leg and the left side of the face, followed after a time by hemiparesis of the whole of the left side, trephined and found a gliosarcoma in the right anterior central convolution; this was removed as completely as possible. The operation was followed by marked improvement of the paretic symptoms; the convulsive phenomena ceased altogether. Eight months later, however, they came on again, though with less severity. A year after the first operation the patient was again trephined, and it was found that recurrence had taken place. The growth was again extirpated, the circumjacent tissue being

removed even more freely than before. The second operation was also followed by improvement, but not complete disappearance of the symptoms.

Deaver and Mills [99 Sept. 1] detail the history of a boy, 11 years of age, who had a pulsating tumor in the occipital region, slightly protruding through a small opening in the skull to the left of the occipital protuberance. A distinct thrill and bruit seemed to be present.

Pressure upon the carotid arteries lessened the pulsation and bruit. The opening in the skull was enlarged so as to examine the supposed aneurism, which appeared to be in the line of the lateral sinus. An exploring-needle was introduced, the withdrawal of which caused bleeding which required long pressure to arrest. Later the left vertebral artery was ligated, but with no beneficial results. After the operation, the pupil on the side corresponding to the cicatrix was contracted. The patient slowly grew weaker, and died several months after the operation. An autopsy was obtained. This revealed a gelatinous mass (gliomatosis) which had occupied much of the fourth ventricle, reaching from or into the middle lobe of the cerebellum and both cerebellar hemispheres. The ventricles of the brain and their horns were enormously dilated, and at several places at the base rupture had almost taken place into the cranial cavity. When the spinal cord was severed from the oblongata, the central spinal canal was found to be one-sixth of an inch in diameter, and from it much fluid escaped.

Albertoni [2 June 25] reported the case of a girl, 15 years of age, who had epilepsy, commencing with spasm of the muscles of the left arm, afterward affecting the whole side. During the seizures there was partial loss of consciousness. She had choked disc, and the diagnosis of tumor, probably glioma, in the right motor zone, particularly in the part corresponding to the parietal and ascending frontal convolutions, was made. Brigatti attempted to remove the growth, which was about the size of a hen's egg. It was scraped out with a sharp spoon till normal brain-tissue was reached. The profuse hæmorrhage was controlled by packing. The patient remained comatose, with marked convergent strabismus, for two days, when these symptoms disappeared. On the fourth day she had an epileptic attack, of a different type from her former attacks, which

was probably due to the tampon. All the symptoms disappeared, including the choked disc. She was still improving at the date of the report.

Nixon $^{22}_{\text{Mar. 2}}$ records the case of a man, aged 28 years, who had symptoms of compression of the right motor area, and in whom abscess was suspected. The bone was found to be very dense and thick, and when it was removed a hard, cartilaginous mass was found dipping deeply into the brain and running forward toward the fissure of Rolando. A part of it ran inward toward the falx cerebri, and was closely attached to the wall of the superior longitudinal sinus. As soon as the pressure was removed from the brain the pulse improved. All his symptoms had disappeared when he recovered from the chloroform. He died from secondary hæmorrhage about a month after the operation.

Wheeler $^{2}_{\text{May 7}}$ reported two cases of trephining,—the first for the evacuation of a cerebral cyst, the second for uncomplicated "word-blindness." The first case lived five days after the operation, which was only performed as a last resource. In the case in which he trephined for uncomplicated word-blindness the patient had recovered completely (now two and a half years ago). The site of the operation was nearly similar to that recorded in the preceding case, and was designated by an injury in that region.

Dobson $^{6}_{\text{May 14}}$ operated upon a case in which there was a tubercular growth in the motor area of the brain, which was sufficient to cause symptoms of so much importance that an attempt was made to remove it. At the operation the growth was not discovered, but the relief of the pressure materially relieved the patient. He died of septic meningitis.

Rodgers $^{760}_{\text{July 16}}$ reports the removal of what was supposed to be glioma, or gliosarcoma, the size of a goose's egg, and which extended from the lambdoidal suture to a point midway between the parietal eminence and the external occipital protuberance. The hæmorrhage at the lower part of the tumor was very severe. The patient left the hospital one month after the operation not much improved mentally. Her after-history is not known. Twynam $^{267}_{\text{May 18}}$ reports the case of a man with symptoms pointing to compression over the right motor region of the brain. He was trephined, but nothing was found. He was not benefited by the operation, and at the autopsy a tumor was found pressing on part

of the velum interpositum. In another case giving the history of a fall, the diagnosis was made of depressed bone or blood-clot pressing upon the arm and leg centres of the left side, and operation was advised. It was postponed for a fortnight, and when he returned to the hospital the symptoms had disappeared. The third case was a boy of 17 years of age, deaf and almost dumb, who developed an otitis media following an ulcer and necrosis of the sternum. After being very drowsy and quiet for two days, during which he vomited frequently, he became very restless and violently delirious. The next day paresis of the left arm and paralysis of the left leg were present. There was also facial paresis. He passed urine involuntarily, and could not retain nutrient enemata; swallowing was difficult. Trunk reflexes were diminished on the left side; no ankle-clonus; patellar reflexes equal; left cremasteric lost. Finally, conjugate deviation of the eyes downward and to the right was noticed. The skull was opened an inch and a quarter behind the ear and a quarter of an inch above the base line. The dura mater bulged considerably on removal of the bone, and when it was divided the brain bulged even more. A needle was passed in in various directions, but no pus discovered. The patient passed a good night, and the next morning serum had oozed through the dressings, and on changing them pus was found, and on slight pressure considerable pus having an offensive odor was discharged. At the autopsy the only cause of the symptoms seemed to have been a tubercular meningitis.

Mudd, of St. Louis, $\frac{5}{\text{Apr.}}$ reports the case of a girl, aged 12, previously healthy, who commenced to suffer from headache in July, 1890. The pain was not continuous, but it was severe while it lasted. In the following October a small swelling was noticed above the right ear, and a tremor was observed,—at first of the left hand only, then spreading to the arm. Later on, the head and leg on that side began to twitch. In March, 1891, the swelling above the right ear had its central point fully half an inch above the level of the skull; its apex was two and a half inches above the external auditory meatus. The patient had left hemiplegia, slightly affecting the face and neck. The muscles of the neck and of the upper and lower extremities were in a condition of rhythmic spasm and tremor; slight in the neck, greater in the thigh and leg, greatest in the arm, forearm, and shoulder.

The spasm was increased by voluntary movement. The left knee-jerk was slightly increased. Pupils natural; slight optic neuritis; left homonymous hemianopsia. An incision was made over the swelling and a flap of bone reflected; the periosteum was closely adherent to the elevated area. The dura mater was attached to the bone. There was no pulsation. When the membrane was incised, a clear, watery fluid escaped, and a collapsed echinococcus cyst was lifted from the opening. Many other cysts, of varying size, were removed, with their contents; and, finally, a translucent cyst was exposed at the deepest part of the depression of the brain. It looked like another cyst, and was punctured. Probably this was the ependyma ventriculi, for the lateral ventricle was opened and drained. The flow of serum was free, and continued for seventeen days after the operation. The walls of the cavity in the brain were scraped with a blunt curette, without any damage being done to the brain-substance. The cavity was about the size of a hen's egg, and occupied the lower two-thirds of the Rolandic region. The patient bore the operation well and made a good recovery. Six months later she was examined. Her gait was normal; there was no paralysis of arm or face, and no tremor; her reflexes were normal; the hemianopsia was disappearing.

Postemski [1085] also reports a case of tumor of the cerebellum in a patient, 22 years of age, who had intense headache for two months, the pain subsequently radiating into the vertebral column and finally producing impaired power of locomotion. There was also difficulty in pronunciation and in vision, slight fever, and vomiting. There was a small superficial scar on the head, caused by a blow from a stone. The patient was improved by operation, so far as the co-ordinate movements of the upper limbs were concerned. Nystagmus disappeared; cremasteric and abdominal reflexes returned; facial paresis was overcome; the tongue lost its deviation from the proper line and its tremulousness, but the lower limbs were not improved.

Knapp [242 Feb.] reports the case of a man, aged 28, upon whom Bradford operated for a tumor of the cerebellum, opening the skull posterior to the anterior end of the fissure of Sylvius. Nothing was found, and the patient was not relieved. At the autopsy a large, sloughing hernia projected through the skull, and the skin and membranes were adherent to the edges of the opening.

Extending upward from the opening was quite a large ecchymosis in the external periosteum of the skull. Nothing was noticed about the external surface of the brain, except some congestion. The cerebrum and basal ganglia were normal. The left lobe of the cerebellum was enlarged, and found to contain a large neoplasm, measuring about three centimetres antero-posteriorly and transversely, and about a centimetre and a half in thickness. It had a dense capsule, and the interior was of a semi-solid consistency. On microscopic examination it proved to be a tubercle. Its posterior end was within six or eight millimetres of the posterior tip of the cerebellar hemisphere; it lay close up to, but not involving, the vermis cerebelli, and was close to the upper surface of the cerebellum. The case presented no distinctive focal symptoms, but it was decided that the tumor was in the right temporal lobe, or in one of the lateral lobes of the cerebellum. This uncertainty was too great to warrant its removal, but the trephining was undertaken, to relieve the increased intra-cranial pressure, and was performed over the right temporal lobe, because the local tenderness, the increased surface temperature, the early loss of smell, and the deafness seemed to localize the tumor in that region. The event showed that these indications were fallacious.

Keen, of Philadelphia, $\frac{1013}{\text{Oct.,'91}}$ excised a meningocele in a boy of 3 years of age. A piece of decalified ox-bone was inserted in the bony defect, but when the wound was opened, at the end of three weeks, this was found to be almost completely absorbed. Burrell and Cushing $\frac{99}{\text{May 5}}$ give a transcript of a paper by C. V. Helly, on a case of pneumatocele, discussing the etiology, condition, frequency, and treatment of this disease. He states that it is an air-containing tumor between the skull and periosteum. The source of the aërial contents is from the air-containing cavities of the skull; the contents, atmospheric air. Hence a communication with such an air-cavity through the bone is necessary to the existence of such tumors. These communications are congenital defects or foramina; abnormally thin bone, solution of continuity from trauma, and the effect of inflammatory processes in the cavities above mentioned, or of its bony walls. Helly has collected reports of seventeen cases where the tumor was occipital. Those where the frontal sinus is the source are, on the contrary, seldom seen. He finds record of eight cases, and his own makes nine.

Fegen, of Brandon, Eng., $^{6}_{\text{June 4}}$ reports the case of a female child with a tumor projecting from the occiput after birth, the size of a medium-sized orange. This was diagnosed as a hydrencephalocele, pressure causing such diminution in its size that the portion of brain contained in it could be distinctly felt, though it could not be returned into the cranial cavity. The child was well-developed at birth, but it began to waste at the end of about the eighth day. Ten days later—*i.e.*, when nearly three weeks old—the tumor became turgid and very black in color, causing the child great and continuous suffering. The covering of the tumor had gangrenous sloughs all over it, and the integument peeled off on being touched. It was removed by means of four double, strong, catgut ligatures passed through and through at the point of junction between the cranium and the tumor ; and, tying very lightly and separately, the tumor was then sliced off and found to consist of gangrenous integument, meningo-opalescent fluid (about one ounce and a half—45 grammes), and a piece of brain-substance about the size of a walnut. The child remained in a critical condition for about ten days, the pedicle sloughing and discharging very putrid pus. At the end of two weeks the ligaments came away and the child made an uninterrupted recovery. Indeed, some improvement was noticed within a few hours of the operation.

Lloyd and Willard, of Philadelphia, $^{242}_{\text{Feb.;}}$ $^{2}_{\text{June 25}}$ report a case of porencephalon in which trephining was done for the relief of local symptoms, with death from scarlet fever. On post-mortem examination a large porencephalon was found involving the left Rolandic region, extending anteriorly beyond the prefrontal fissure downward almost or quite to the operculum, backward to include the superior parietal lobule, its area thus coinciding very closely with the area of distribution of the middle cerebral artery. In the mid-region of the cavity was a large crater-like opening extending into the lateral ventricle. The authors express the opinion that vascular disease or injury must have been the origin of the cavity in the brain.

A case of meningocele spuria traumatica, at Czerny's clinic, led Bayerthal $^{761}_{\text{v.7,p.367}}$ to investigate this lesion. His patient was a boy aged 7. The tumor was noticed two days after birth. Delivery instrumental. Site, left parietal region. Tumor soft, size of a bean when first noticed; growth corresponds to growth of body.

Pulsation synchronous with heart. Crying, coughing, etc., cause tumor to increase in size. It is surrounded by a bony ring, the edge of the adjacent bone. Strong compression causes symptoms of cerebral compression,—that is, loss of consciousness, dilated pupil, deep and prolonged respiration, convulsions, etc. Bayerthal has found twenty-one cases, with eight autopsies.

Bayer[88] Nos. 28-30 operated upon three cases of meningocele. The first was a girl, 5 days old, with an occipital meningocele. The circumference of the skull was thirty-three centimetres; the circumference of the tumor, twenty-two centimetres. The skin in places over the tumor was excoriated, the base included the whole occiput, and pressure on the tumor caused bulging of the anterior fontanelle. In the centre of the occipital bone an opening which can be just closed by the tip of the index finger could be felt. The skin around the base of the tumor was dissected off far enough away from the pedicle to furnish flaps of sufficient size to cover the wound after the removal of the tumor. The pedicle was ligated with silk, after determining that the sac was filled only with fluid. The sac was then cut off, and two lateral periosteal flaps were brought over the ligated pedicle and the wound closed Excepting the oozing of some cerebro-spinal fluid, necessitating a secondary suture, no complication supervened. Two years later the child was living and well. The second case was 18 weeks old, had convergent strabismus, no paralysis. At the nape of the neck there was a compressible fluctuating tumor of the size of a small apple, which had a broad base, covering the whole region of the neck from the occiput down to the vertebra prominens. An opening could be felt at the region of the third or fourth cervical vertebra, and the case was considered one of meningocele or myelo-meningocele cervicalis. After dissecting off the skin-flaps, a pedicle the size of a finger was found; the sac was opened, but no nerve-fibres found, and so the pedicle was ligated. The fascia was carefully closed, and no paralysis followed the operation. The child died eight days later, of meningitis. At the autopsy it proved to be a hydrencephalocele cerebellaris cervicalis. The last case was 9 months old, and had a transparent tumor measuring fourteen centimetres around the base, over the summit of the lambdoid suture, the small fontanelle being completely covered by it. No opening in the skull could be made out. When the flaps had

been made, a peculiar jelly-like tissue protruded. This was shaved off in layers, and at its base a small tumor, covered by dura mater, and of the size and shape of the end phalanx of the finger, was found coming through the small fontanelle. Flaps in the fibrous tissue on either side of the small fontanelle were cut, a cerebral hernia was replaced, and these flaps united above it. The patient, a year later, was perfectly well. In another case of occipital encephalocele the treatment consisted in removing both the sac and the hernia with the thermo-cautery. The child died a few days later. Pus was found in the ventricles.

GENERAL PARALYSIS OF THE INSANE.

Macpherson and Wallace, $\frac{2}{\text{July 23}}$ in an interesting paper detailing the results of operation in five cases of trephining for general paralysis of the insane, consider that "the operation was justified (1) because the pathology of the disease seemed to mark it as capable of relief by surgical operation; (2) because further acquaintance with the results of operative interference was desirable in the present state of our knowledge; (3) because of the proved safety of operative treatment." They regarded this condition as resulting from changes due to a specific inflammation, chronic in its course, which seizes upon the vascular tissues of regions weakened, it may be, from lack of proper innervation as well as by too frequent hyperæmia due to excessive or too frequent functionating, and conclude that in the earlier stages of general paralysis an inflammation exists which chiefly affects the blood-vessels of the fronto-parietal region.

Two pathological consequences, both highly detrimental to the brain-cortex, result from this inflammatory affection of blood-vessels. First, there is an interference with the nutrition of nerve-cells, and, secondly, there is an effusion of fluid which causes injurious pressure upon the brain within the cranial cavity. Later on, in the course of the disease, after the degeneration of the nerve-cells has become pronounced, the growth of spider-cells interferes still further with the lumen of the canals and produces kinks in the course of the arteries; but in such an advanced stage operative measures would cease to be of any benefit upon any recognizable hypothesis except that of the restoration of degenerated cortical tissue, which is, in the present state of our knowledge, impossible.

In the discussion following the reading of this paper the opinion seemed to be general that, while the hopelessness of the condition justified almost any undertaking, little improvement could be expected from trephining.

Tuke, of London, $\frac{2}{\text{Jan. 16}}$ reports a case operated on by Duncan. Its history is much the same as that of all others which have been trephined for the intra-cranial pressure following on "general paralysis." So long as fluid can drain, there is relief of symptoms, but as soon as the wound heals they return, and the disease runs its course. But the mere temporary relief is of considerable interest, and points to inquiry as to whether a channel of permanent drainage cannot be found. It is to be feared that this cannot be got from the superior surface of the skull. Were it possible to reach the great cisterns at the base, a flow might be obtained; but many anatomical difficulties stand in the way, and even if they were overcome, it is doubtful whether permanent drainage could be kept up.

The operation which appears to Tuke the most likely to obtain thorough drainage of superabundant cerebro-spinal fluid is laminectomy of the second or third lumbar vertebra, puncture of the loose arachno-pia, and, as suggested by Duncan, the insertion into the pial sac of small threads of horsehair. Duncan has lately performed the operation of laminectomy at the suggested spot for traumatic injury with little difficulty, and, although the flow of cerebro-spinal fluid amounted to eight ounces a day for three weeks, the patient recovered. For a time during the great flow he had headache and was restless, but no other more serious symptoms presented themselves.

CEREBRAL ABSCESS.

Gruening, $\frac{80}{\text{Apr. 15}}$ in mastoid disease, after the usual incision through the soft parts, enters the bone through any soft point or with a chisel behind the spina cupra meatum if the surface is firm, then he removes the whole cortex of the mastoid with a small rongeur, obtaining complete command of his operative field, and being able to avoid the lateral sinus and carry out such further surgical proceedings as the case may demand. The wound may be packed or closed at once.

Panse $\frac{80}{\text{Apr. 15}}$ gives, in his report of the Halle Ear Clinic for the previous year, details as to the 67 mastoid operations among the

1605 patients. Most of them were done in the usual method of Schwartze; but the later cases, to the number of about a dozen, were done by Stacke's method of dissecting off the auricle and soft tissues of the canal and laying them forward, chiseling away the posterior bony wall and anterior wall of the attic, so as to throw meatus, attic, antrum, and tympanum proper into one open and visible cavity, then replacing the soft parts and transplanting a flap of canal-lining into the antrum. In these methods radical removal of all diseased structures is attempted, yet in such an open manner as to rob the operation of many of its gravest dangers; important structures can be more surely avoided, healing is likely to be greatly expedited, and the recovery should be secured with a condition far less likely to relapse into cholesteatoma or other renewed troubles.

Dean $_{July\ 30}^{2}$ says that in every case of cerebral abscess following otitis media the surgeon can, with one skin-flap and with one trephine-hole, explore both the temporo-sphenoidal lobe and the cerebellum. It should be laid down as a rule that in all these cases the surgeon must be prepared, before commencing the operation, to search, if necessary, both above and below the tentorium. If the pin of the trephine be placed one inch behind and a quarter of an inch above the external auditory meatus, a part of the lateral sinus and the dura mater just above it are exposed. After slightly enlarging the hole upward with a pair of Hoffman's forceps, the dura mater can be incised and an exploration of the temporo-sphenoidal lobe satisfactorily carried out. If the pus be not found, the trephine-hole can be enlarged for about one-third of an inch downward and backward, exposing the whole diameter of the lateral sinus and the dura mater for a small extent below it. By incising the dura mater below the lateral sinus, the cerebellum can be easily explored within five minutes of exploring the temporo-sphenoidal lobe. If, after exposing the brain, evidence of meningitis be present and no pus can be found, the lateral ventricles should be tapped by inserting the trocar inward and slightly upward just above the lateral sinus. It is evident that the only satisfactory way of relieving the pressure caused by the inflammatory effusion of meningitis is to drain the lateral ventricles. By this operation the lateral sinus can be easily examined. An exploring-needle connected with an aspirator—or,

better, a hydrocele trocar—can be inserted into the sinus. If blood flow freely from the trocar, thrombosis of the lateral sinus can be excluded. He reports a case of mastoid disease with cerebral symptoms. When the mastoid was opened some pus was found, and the tympanic canal and the mastoid were cleaned out; the lateral sinus was tapped with a trocar and cannula to ascertain whether or not it was thrombosed, but it was found to be all right and was not interfered with. A fortnight later, grave symptoms of cerebral compression having supervened, another operation was performed, according to the plan detailed above, and no disease was found in the temporo-sphenoidal lobe, although there was considerable bulging of the dura. The trocar was inserted into the lateral ventricle, evacuating a few drachms of clear fluid. The lateral sinus was also tapped, but was found filled with liquid blood. The bony opening was then enlarged backward and downward, and the right lobe of the cerebellum was explored, revealing an abscess from which over an ounce (30 grammes) of pus escaped. This was drained, and twenty-eight days later the patient was perfectly well, with the exception of a slight purulent discharge from the external auditory meatus.

Ransom and Anderson $\frac{2}{\text{Apr. 23}}$ report the history of a man who had had a chronic otitis media for thirty years. This suddenly diminished, the ear became painful, and there followed a rigor, some delirium, and some deafness in the right ear. The mastoid process was trephined; the bone was much sclerosed, and neither air-cell nor pus was discovered. The patient's condition having become decidedly worse, Anderson explored the temporo-sphenoidal lobe for pus. On removing the circle of bone, the dura mater bulged into the wound. A hydrocele trocar was thrust into the presenting portion of brain, in a direction downward, forward, and inward, and at the depth of an inch pus was reached. About 1½ ounces (45 grammes) flowed out, yellowish green in color and extremely offensive. The abscess-cavity was syringed out with 1–2000 sublimate solution, the wound closed, a drainage-tube inserted into the cavity, and a dressing applied. The patient has since remained in perfectly good health, both mentally and bodily.

Morrison, $\frac{104}{\text{July 30}}$ in a case of punctured wound of the brain, in which operation was delayed for nine days, when symptoms of cerebral compression necessitated opening the skull, applied a

trephine over the injury, which was parallel to and one inch in front of the Rolandic end, and a spicula of bone was found penetrating the dura. When it was removed, there was an immediate escape of pus. The patient made a satisfactory recovery.

Moure $^{3}_{\text{Apr.27}}$ has reported a case where the mastoid was trephined when the patient was almost comatose. The bone was eburnated, but there was neither cellule nor pus found. A drain was placed in position, and the patient made a satisfactory recovery. The cavity was not curetted. An interesting case of a man who had been kicked in the ear when a child, and who had had occasional attacks of offensive otorrhœa, finally developing pyæmia and swelling and tenderness of the neck over the upper part of the jugular vein, but no tenderness over the mastoid, is reported. Parker $^{2}_{\text{May 21}}$ operated, cut down to the left jugular vein, and exposed the mastoid process. The vein was firmly plugged from the base of the skull to below the junction with the facial, which was also plugged for an inch or so. Both veins, together with a mass of lymph-glands, were ligated and removed. He also operated $^{187}_{\text{Jan.}}$ in a similar way on a second case, which died.

Polo $^{136}_{\text{Jan.15}}$ reports the case of a child of 6 years, who showed all the symptoms of mastoid disease and compression of the brain. The mastoid was opened and nothing found, although a large quantity of very dark blood escaped. The condition of the patient at this time was so bad that further exploration had to be suspended, but the next day it was determined to explore the brain. The whole temporal region was tender to pressure, but, as it was known that abscesses of the brain following mastoid disease are usually located about the temporo-sphenoidal lobe, this spot was selected for exploration. No pus was found until the third puncture; after the needle had penetrated to a depth of four centimetres, pus was drawn into the aspirator. Two coffeecupfuls were removed, the abscess was laid open, using the needle for a guide, and packed with iodoform gauze. The patient died the following night, without improvement in the symptoms.

Laurent $^{868}_{\text{June 18}}$ has invented a trocar and cannula by which the mastoid can be opened and the trocar then removed, leaving the cannula in place, thus determining the condition and allowing the evacuation of pus, etc.

Jalland $^{6}_{\text{Mar.5}}$ operated upon a man of 19, who had suffered from

otorrhœa for ten years. He complained of great pain over the right side of the head, became delirious, and seemed to have convulsions that were not confined to any special part of the body. He lay in a condition of cerebral irritation on the left side, with the knees drawn up, complaining of great pain over the left side of the head and across the brows; tenderness on percussion over the left side of the head. Finally he became restless, developed a divergent squint in the right eye, and became semi-comatose. An operation was performed, the skull being opened, one inch and a half above and half an inch behind the meatus auditorius externus. A fine exploring-needle passed slightly backward into the brain allowed the evacuation of from one to two ounces of fetid pus. This abscess-cavity was drained. The patient died the following day. An abscess in the temporo-sphenoidal lobe, the size of a small hen's egg, was found.

INTRA-CRANIAL HÆMORRHAGE.

Starr and McBurney, of New York, [47 Pts.2,3,'91] report an interesting case of a physician who had been thrown from his carriage and was slightly stunned, but had no wound. During the evening following the accident he became delirious, and for three days remained semi-comatose. The morning after the injury there was complete hemiplegia of the right side, and aphasia. When, after a week, his consciousness had fully returned, it appeared that the aphasia was purely motor, as he could understand what was said to him and could read. The hemiplegia was attended by a partial anæsthesia, the paralyzed limbs felt numb, were less sensitive to touch and to pain, but acutely sensitive to cold and to heat. He evidently understood questions, and attempted to reply by gestures, and by trying to write with his left hand. Tactile and pain senses were found to be impaired on the paralyzed side. He was emotionally unstable. Ophthalmoscopical appearances, sight, and hearing were normal. The right hemiplegia was partial. He could turn his eyes in all directions, but could not turn his head to the right. His left pupil was one-third larger than the right pupil, but both reacted normally. His face was slightly flat, but not paralyzed, and his tongue protruded straight. His arm was almost totally paralyzed, the only motion possible being a slight abduction at the shoulder. His leg could be moved a little at the hip and

knee, and when held up by two persons he could drag the leg forward a little, but could not stand alone. The hand was flexed and pronated, the leg was extended; both were very rigid, and all the deep reflexes were greatly exaggerated, so that wrist and finger clonus, as well as patella and ankle clonus, were easily produced. He controlled his sphincters perfectly. There were no scars upon the head.

McBurney trephined the skull at a point one inch and seven-eighths behind and seven-eighths of an inch above the external angular process of the frontal bone, the opening being then enlarged by the rongeur forceps upward and backward, the dura being laid bare over an oval area three by two inches. The dura did not pulsate. The pia was found to be very œdematous and discolored, and the surface of the brain was separated from the dura by a space of half an inch in depth, and did not pulsate. The clot was seen lying beneath the pia upon the posterior part of the third frontal convolution, and extending over the anterior central convolution, in a thin layer into the fissure of Rolando, which was filled with a larger clot extending downward so as to fill up and distend greatly the *cul-de-sac* at the lower end of the fissure. The clot had not covered the lower third of the anterior central convolution, and had not reached the upper quarter of the fissure of Rolando. The brain, at a distance of an inch about it, appeared to be healthy and pulsated, but the parts of the cortex on which the clot lay were pulseless, and stained a yellowish red. After the pia had been incised, the clot was removed little by little, by fine sponges, at least 1 drachm (4 grammes) of partly-organized clot being taken out of the fissure of Rolando. The retraction of the brain from the skull was even more evident when the operation was complete. The case indicates the existence of tactile sensory functions in the cortex of the motor area.

Maglioni $\frac{92}{\text{Dec.,'91}}$ reports two interesting cases of cranial trephining: the first, in a man who received a blow on the left side of his head, and in whom there were no signs of fracture or depression. Symptoms of compression soon developed, pointing to a hæmorrhage of the middle meningeal artery. Five days after the accident his condition was so serious that any surgical treatment seemed almost useless; nevertheless, trephining was done without an anæs-

thetic. When the flap was reflected, a V-fracture of the parietal bone, without depression, was discovered; when a button of true bone had been removed, a large clot was found resting upon the dura. Patient died three hours afterward. The second case, a man, was struck on the head by a piece of timber, rendered unconscious, and was paralyzed in both legs. The right leg was more affected than the left; there was paresis of the right arm. For two months he was unable to walk, and after that could only get about with great difficulty and with the aid of a cane. There was a marked depression on the left side, at the antero-superior angle of the parietal bone. The depression was removed, but the patient's improvement was very slight.

Ruth $\frac{61}{\text{Feb.6}}$ also reports the case of a child of 5, who fell, striking on her head; was unconscious when picked up, but remained so only a short time; no fracture, depressed bone, or other evidence of serious injury could be discovered. She became somnolent, answered questions correctly, but hesitatingly, and had perfect sensation and muscular co-ordination. There was discoloration of all the palpebral and ocular tissues, with sufficient œdema to completely close the right eye; the left pupil responded readily to light. Trephining revealed a clot three-sixteenths of an inch in thickness and one inch in diameter, which had formed between the dura mater and the parietal bone. This was evacuated and drained, and the child recovered.

Stewart $\frac{36}{\text{Feb.}}$ reports the case of a man who fell, receiving a wound, and continued his work; but, twenty minutes after, while talking, became unconscious, and had a convulsion. There was a scalp wound one and a half inches long, leading to unfractured bone, about one and a half inches above the base of the left mastoid process. The convulsions indicated compression over the right motor tract. Trephining was done on that side. As soon as the skull was perforated, there was a profuse and persistent flow of blood, amounting to between 4 and 6 ounces (120 to 180 grammes), which came from the middle meningeal artery. The man resumed work about six weeks after the accident.

Smart $\frac{2}{\text{Dec.5,'91}}$ reports the case of a woman who received a blow on the head near the parietal eminence. She was conscious for some time, her face drawn to the right, but without ptosis, and there was no ocular deviation. The pupils were medium in size,

nearly equal, and reacted fairly to light, but there was left lateral hemianopsia. She could not raise the left arm, nor grasp with the left hand, the left forearm remaining flexed, and the fingers curving upon the palm. The thigh and leg movements were defective in a less degree, and the sensibility of both arm and leg, as also of the whole of the left side, was irregular and deficient. Speech was somewhat slurring, but not aphasic. Some hours after admission coma set in, and later Cheyne-Stokes breathing supervened, and soon became so grave as to threaten life. Chiene trephined, first at the place where the blow had been received, and a second time further forward and a little lower. There was free hæmorrhage from the membranes, but no discoverable cause was found within reach of the director or finger to account for the symptoms. This result corroborated the diagnosis of a right basal lesion, as determined by the existence of a left lateral hemianopsia. The breathing, which was characterized before the operation by lengthened intermissions, and was well-nigh suspended, had become almost normal before the operation was completed, and thereafter continued to improve. This effect was especially noticeable after incising the dura, which was immediately followed by cerebral hernia, thereby giving relief to the cerebral pressure and tension. The patient, a few hours after the operation, had regained consciousness, and continued, as regards her intelligence, to improve, when she left the hospital in complete possession of her faculties, the hemiplegic disability above referred to continuing, with the addition that the left intercostal muscles were now observed to be involved in the paralysis affecting the left side. Smart says that, so far as he knows, this is the first example of trephining for a basal lesion, the case being diagnosed from the beginning as an apoplexy at the base. The success attending it will doubtless encourage the performance of that operation in similar cases, and, speaking generally, widen the basis whereby it is rendered justifiable.

FRACTURES OF THE VAULT OF THE SKULL.

Ollier, of Lyons, $\frac{211}{\text{Dec.20,'91}}$ recommends what he calls *trépannation bihémisphèrique* in cases of cerebral lesions that cannot be exactly localized. He has performed this bilateral trephining three times. The first patient was a boy, who developed epileptiform convulsions several years after a fracture of the skull. He complained

of pain over the frontal region, but there was no bony abnormality to be found. The premonitory aura was in the epigastric region. There were no contractions nor paralysis. The bone over the painful spot was removed, and a spicula was found pressing upon the dura mater. For five months the patient remained well. At the end of this time there was a return of the epilepsy, and a second trephining was performed alongside of the first. The relief lasted seven weeks. Still a third operation was undertaken, but the symptoms returned this time within fifteen or twenty days, when he had such a series of convulsions that death seemed imminent. The cicatrices of the former trephinings were then re-opened, and the skin, dura mater, and pia mater were found fused together in a single fibrous membrane. This was freed from the brain throughout its whole extent, and the result was very satisfactory. During the next three days he had only two or three convulsions, and then was free from them for five months, when he went into coma with paralysis of all the extremities. A double trepanation was done, this time behind the right parietal eminence, but nothing was found; so the cicatrices were freed as before, and once again he passed from four to five months without an attack. At the end of this time he became violently angry, and lapsed into almost constant violent convulsions. Trephining was without result and death ensued. At the autopsy nothing was discovered to account for the condition. Another case was in a child of $3\frac{1}{2}$ years, who had continual convulsions, could not speak, cried constantly, and could not recognize its parents. The condition had followed a fall on the head, but it was impossible to localize the place of injury. A bilateral trepanation was undertaken deliberately. One button of bone was removed from the right parietal eminence, the spot where the traumatism had occurred, and a second on the left side, over Broca's convolution; the dura mater was not incised. The child's condition was at once improved; he could say some words, recognize his parents, and had no convulsion for eighteen days.

Cerné [203 Feb.] reports the case of a patient who fell, receiving a fracture of the parietal region. He was brought to the hospital in a comatose state, with a rise of temperature, which was increasing, and developed, first, a paralysis of the left arm, then paralysis of the lower extremity, and, finally, convulsions of the whole side.

The resection of the fragment afforded no amelioration of the condition, and twenty-four hours later the wound was re-opened and the dura incised. Twenty-four hours later the temperature began to fall. The paralysis disappeared very rapidly in the leg and face, but much more slowly in the arm, which, eleven months later, was still below the normal. Some time later epileptiform convulsions, beginning with tingling in the arm, set in. This is attributed to the adhesions between the cicatrix in the skin and that of the cerebral surface, in consequence of the treatment of the wound by the open method. He considers that trephining should be employed more often and as soon as there is sufficient sign of the lesion, for if we wait for the onset of meningitis there are great chances of not being able to arrest it.

Roux [197 Sept. 20] presents three cases of fracture of the cranium. The first had had a fall on the head, followed by cephalalgia, epileptic crises, stammering, enuresis. At the operation a small, bony button pressing on the dura mater was found and removed; all the symptoms improved at once, and the patient is recovering. The second case suffered from symptoms of compression,—weak pulse, somnolence, etc. The first trephining—on the right—revealed a clot of blood on the dura mater. Epileptic crises and aphasia followed, and at a second operation—over the fissure of Rolando—a small, serous cyst was found and incised. Recovery followed. The third case had suffered excruciating headaches after a fall. Eight days after the accident he fell suddenly to the ground, and has been subject to frequent attacks of epilepsy. A wound was found over the right occipital bone; diagnosis of fracture of the skull and lesion by *contre-coup*. Trephining was performed on the occipital bone without any result, but a second operation—over the left fissure of Rolando—showed a little coagulated blood. The patient recovered.

Pittman [86 June] reports the case of a boy, 6 years old, who received a compound depressed fracture of the frontal bone, under which there was a large clot. The depressed portion of bone extending down to both superciliary ridges was removed, the clot washed out, and wound closed. He died seven days after the accident and four after the operation. At the autopsy a meningitis and an abscess at the site of the injury were found. Titus and Rardin [53 Dec. 19, '91] report the case of a man with compound fracture of the right

parietal bone, extending from a point one and a half inches behind and two inches above the external angular process of the frontal bone, backward and slightly downward, with an irregular curvature, with convexity upward; the bone on the concave side of the line depressed the thickness of the skull so that it was held beneath the inner table of the convex side. The wound was trephined and considerable blood found, which had accumulated from a rupture of the anterior branch of the middle meningeal artery. Hæmorrhage was controlled by torsion and Monsel's solution. Recovery was uninterrupted.

Fowler $\frac{120}{\text{Sept.}}$ reports a case of compound comminuted fracture of the squamous portion of the temporal bone. The fractured portion was removed, the dura found intact, and the wound was closed. The patient recovered. In another case there was also compound fracture, with rupture of the membranes and laceration of the brain. The broken bone was removed, several splinters being taken from the brain; the wound was irrigated, and, though some suppuration set in, a good recovery was made. He also reports another case $\frac{120}{\text{Apr.}}$ of depression of the skull near the sagittal suture. The entire parietal bone was found to be broken in several pieces. One inch of the temporal bone, a square inch of the occipital, and a small part of the frontal bone were broken loose. The bony fragments and blood-clot were removed and the wound irrigated and closed. There was some suppuration, but recovery was good. Bell $\frac{6}{\text{Aug. 27}}$ reports the case of a young man who walked into the hospital with aphasia, following an accident the previous day. Several large fragments of bone were found buried in the brain. Trephining was performed over the parietal eminence, and six large pieces of bone, placed so as to form a cone over an inch in depth, were removed. A considerable portion of cerebral matter escaped during the operation, and while the fragments were being removed there was marked twitching of the muscles of the right side of the face and the right hand. Recovery was complete, except for a slight difficulty in speech.

Hutton $\frac{2}{\text{Sept. 24}}$ reports a case of a child of 11 years, who was struck over the left frontal eminence, inducing a triangular depression of bone. Trephining was done without an anæsthetic, as the patient was completely unconscious. The inner table was found driven a quarter of an inch under the margin of the skull;

the dura had been scratched, but was not perforated. The patient recovered.

Bland Sutton [2 Jan.16] has given the details of a case in which a man was conveyed to the Middlesex Hospital, London, in an insensible condition, due to falling upon the pavement and striking his head when drunk. A very large clot of blood was found between the dura and the bone. In order to secure the torn artery, it was necessary to remove the bone freely. By means of an electric search-light a fissure in the bone was found to run from the left limb of the lambdoid suture downward into the tympanum and across the petrous portion of the temporal bone. At this spot the dura was lacerated and the subdural space opened. After the operation, motor power returned in the paralyzed limbs, cerebrospinal fluid escaped during four days, but the patient quickly became conscious and made an uneventful recovery. Symonds said, in the discussion following the report of this case, that he had operated upon three such cases. In the first case, the bleeding was from a deep source, and he had controlled it by fixing a pair of forceps deeply in the wound, after removing a large quantity of bone. The bleeding ceased, but the man died, apparently from prolonged exposure of the dura mater. He thought it would have been better to tie or compress the common carotid at the beginning of the operation. In his second case, the patient had universal convulsions, and recovered after trephining. In the third case, the patient, a boy, was almost dead. He was rapidly trephined, and also recovered. Compression of the common carotid might sometimes be necessary for three or four hours after trephining. Godlee had also seen several similar cases. They were usually fatal, which he considered due to the fact that they were left for a time without operation, and the brain was thereby so compressed that it did not afterward expand.

Morgan [2 Jan.30] showed a case of compound fracture of the skull treated by trephining and replacement of bone. A child, 2 years of age, had fallen from a third-story window, striking the back of the head, which was flattened. On pressing the swelling over the head, clots mixed with brain-substance exuded. Double lines of fracture ran across the vertex of the skull, and at the apex of the right parietal bone there was a depressed piece, which was removed by trephining. Other pieces were lifted out and the

damaged brain-tissue was washed away. Then the pieces of bone were washed, replaced in their natural position, and the pericranium united by suture. The greater part of the wound had healed by the ninth day, and recovery took place without a bad symptom.

Areilza [456 Aug.10; 2 Sept.24] reports the following case: A lad aged 18 sustained a comminuted fracture of the skull, with injury to the brain, from a dynamite explosion. The loss of brain-matter was considerable, and comprised the junction of the middle and posterior thirds of the first and anterior frontal convolutions, especially the former. The excavation was sufficient to allow of the passage of a drainage-tube to a depth of five centimetres from the cranial surface. The wound was thoroughly cleansed, closed with stitches, and covered with an antiseptic dressing. In two days the temperature fell to normal. The drainage-tube was taken out in ten days, and by the end of June the patient was completely cured. The wound was firmly healed, the brain adherent, and pulsation not very marked.

Shepherd, of Montreal, [282 Aug.] reports the case of a child who had received a severe compound fracture of the skull. Two pieces of bone, about the size of a twenty-five-cent piece, were removed, and the wound thoroughly cleansed; the torn dura mater was sewed with a continuous catgut suture, and the skin wound brought together as well as possible. The child made a rapid recovery, and in no way is she now different to what she was before the accident occurred. Weir [40 June] presented to the New York Practitioners' Society a boy who had received a depressed fracture at the junction of the forehead and hairy scalp. The removal of the fragments left a space about an inch and a half in diameter. This gap was filled with a celluloid plate, about one-sixteenth of an inch in thickness. The scalp healed over it rapidly, and the boy has thus far experienced no difficulty. Walsham [6 May 28] operated successfully upon a child aged 8 years, who suffered from a compound depressed fracture of the skull, about an inch behind the external angular process of the left side of the frontal bone. The depressed bone was driven into the dura mater, but there was no laceration of brain-substance.

Puzey [187 July] reports that during the last two years there have been seventeen cases of operation for compound depressed fracture

of the skull performed at the Northern Hospital, Liverpool. Out of this number, only three have died, and it appears that two of these fatal cases were secondary operations,—*i.e.*, "too late" operations,—one of them being sent into hospital in a moribund condition, and the third patient was also suffering from fractured spine. He reported four cases: The first—a boy—received an injury of the head; remained conscious, but complained of pain in the head. Half an hour later convulsions set in, beginning in the right side of the face and extending to the right arm. There was a long, crescentic-shaped fracture across the posterior part of the frontal bone, and, after trephining, several small, detached fragments of the inner table were removed. The dura mater was scratched or punctured in two or three places by these sharp fragments. Some months after, the large, bony gap was found to be filled with bone. Recovery was perfect. The second was also a case of compound fracture, and the inner table of the skull was found considerably shattered and somewhat depressed; one piece was sticking in the dura mater. He recovered. The third case was a boy of 17 years of age, who was struck on the head with a piece of an exploding vat. He had a large, jagged wound in the left temporal region, filled with clot and brain-matter. The finger passed through a large opening in the skull into the brain, in which a piece of bone was felt. On removing the finger, arterial blood welled up rapidly. The wound was enlarged, one or two loose pieces of bone were removed, and a large branch of the middle meningeal artery was found torn through; both ends were tied. A fragment of bone, which had been driven edgewise into the brain, was extracted. A large piece of depressed bone extending toward the malar bone was elevated, but not removed. New bone formed in the gap so rapidly that at the end of six months it was so completely filled by the new formation that the metal plate which he had worn over the spot for protection was discontinued. The fourth case was a woman who was shot in the head, and who had two wounds over the left parietal eminence, evidently the wound of entrance and of exit. When these wounds were joined by an incision, a depressed fracture was revealed, and a piece of the bullet was found firmly wedged in the fractured bone. The internal table was more extensively fractured than the external, and considerable bone had to be removed before the pressure was

relieved. There was a tear in the dura mater, through which a clot escaped during the irrigation. The patient made a complete recovery, and the bony gap became closed apparently with bone.

Williams $^{120}_{\text{Aug.}}$ operated upon a negro with a fracture of the skull from a blow ten days before, and in whom a collection of pus was found and evacuated. The trephine-opening was made just below the squamous suture. The depressed bone was elevated and the patient made a favorable recovery. Williams also operated $^{1}_{\text{Jan.9}}$ on another negro who was struck on the head, sustaining a compound fracture, with marked depression and extensive comminution, in the right parietal bone, at the centre of the Rolandic region. A spastic rigidity persisted in this case, quite similar to the condition that obtains in so-called spastic spinal paralysis, and probably due to a like cause, viz., degeneration in the pyramidal tract and lateral column of the cord,—in this instance a descending secondary degeneration, the result of partial destruction of the arm-centre. The patient is, at the present time, able to work.

Briddon $^{1}_{\text{May 21}}$ presented a man with a V-shaped fracture of the right temporal bone, the apex of the V pointing downward, and the arms extending upward to the squamo-parietal suture; the apex was depressed about an eighth of an inch. This was elevated and removed, exposing a clot. The opening was enlarged to the extent of an inch and a half, and the clot removed. Examination showed a fissure extending downward through the root of the zygoma into the petrous portion, but it could not be followed farther. The dura was opened and the brain-substance found lacerated and contused. Several small clots and a good deal of broken-down brain-matter escaped. There was a considerable protrusion of cerebral substance through the opening. Two drainage-tubes were introduced, and the wound was dressed open. On the following day the patient responded intelligently to questions, but was delirious at times. The tubes were removed at the end of ten days. There was a protrusion of brain-substance. Facial paralysis was still present, and there was complete deafness of the right ear. There was a continuous flow of cerebro-spinal fluid, the pillow being constantly soaked; the liquid could be seen distilling from a small fistulous opening, situated in the centre of the granulations covering the exposed brain. The amount

that escaped every day was estimated at about two ounces and a half. An aluminium probe was allowed to pass by its own weight into the sinus a distance of two inches and a half, evidently entering the ventricle. The flow gradually diminished, and in three weeks had ceased entirely. *Pari passu* with these changes the brain receded and cicatrization ensued. At the present time the wound is entirely healed, but the cicatrix is tender, and pulsation of brain can be detected over the area of the operation. No paralytic conditions remain, except some obliteration of the naso-labial fold. One feature of extreme interest remains unexplained. Before this accident the patient had been the terror of the neighborhood in which he lived, frequently coming in contact with the police. Since his recovery his character has entirely changed; he has lost all his aggressive traits or they are in abeyance; he is amiable, and, as a convalescent, occupies himself in ministering to the other patients in the ward.

Myerle $\frac{157}{\text{Apr.}}$ reported two cases of compound fracture. The first, over the right frontal eminence, was trephined, and recovered without incident. The second was a compound multiple fracture on the right side, and two wounds were found,—one on the right side, about two inches from the median line, and the other on the same side, four and half inches from the same line. The whole parietal region was crushed in, and the fragments, eight in number, were removed. The dura mater was slightly lacerated. Five months after the injury the patient was perfectly well. He died of *la grippe* last spring.

Bensel $\frac{1}{\text{Jan.16}}$ reports the case of a man who was struck in the forehead, sustaining a compound depressed fracture of the skull. The depressed portion of bone was found to be almost completely detached from the surrounding bone and depressed for about half an inch, tearing the meninges very extensively. The removal of the detached bone was followed by a tremendous hæmorrhage from the superior longitudinal sinus, which could not be controlled by packing. The sliding-catch of a Langenbeck artery-clamp was placed under the open end of the superior longitudinal sinus, *beneath* the edge of the opening in the skull; the middle of the catch rested *on* the edge of the opening, which formed the fulcrum of the lever; the other end of the catch projected out of the wound, and was fastened firmly to the skin by two sutures. This

controlled the hæmorrhage perfectly. On examining the frontal lobes of the brain, a laceration was found in the right, an inch and a half deep and half an inch wide, and one in the left nearly half an inch deep. The wound was packed very lightly with bichloride gauze. At the end of forty-eight hours the dressings were removed. The metal catch had remained in place and checked the hæmorrhage completely. He made a very good recovery.

Stetter $^{336}_{\text{May 21}}$ operated on a man aged 28 years, with a bony depression in the posterior portion of the right parietal bone, who had become insane in consequence of the injury. Mental condition was markedly improved by operation.

Sonnenburg $^{69}_{\text{Apr. 28}}$ presented a patient with a punctured wound of the skull, on the posterior margin of the left parietal bone. He was operated on by the method of temporary resection. An opening, one and five-tenths centimetres long, into the brain was found, which was disinfected, and cauterized with the Paquelin cautery. Recovery was uneventful. Körte, in the discussion following this paper, reported a similar case of injury to the skull, without symptoms, in which a fissural fracture was discovered; but the patient succumbed during chloroform narcosis. Bergmann $^{21}_{\text{May 2}}$ reports a case in which, though marked symptoms of intra-cranial pressure were absent, still a brain-abscess, following a fracture of the frontal bone, was suspected, and an exploratory operation revealed an abscess the size of an apple. The patient recovered.

Murray $^{2}_{\text{Feb. 13}}$ operated upon a girl, aged 5 years, who, a fortnight before being admitted to the hospital, was struck on the right side of the head with a poker. No symptoms of moment appeared till fourteen days later, when she had twitching of the left arm and left side of the face, lasting half an hour. These convulsions increased gradually. A small, sloughing, scalp wound was seen in the right parietal region, occupying a position corresponding with the junction of the upper and middle third of the Rolandic fissure. Bare bone was struck with a probe, which could readily be passed through a small aperture into the cranial cavity. The dura mater was found torn at its centre, but firmly adherent all along the trephined margin; the brain-substance beneath was in a soft, sloughing condition and did not pulsate. A probe passed without the least resistance into the substance of the

brain, in a direction downward, inward, and slightly backward, and at the depth of two inches entered an abscess-cavity, about a drachm of thick, non-offensive pus escaping. Sinus forceps were then passed in the same direction, and withdrawn slightly opened. The abscess-cavity was then well washed out with a solution of bichloride of mercury (1–5000), a small mass of brain-slough was removed, and a drainage-tube inserted. The child made an uninterrupted recovery.

Lewis [157 June] reported a case of a man who had been struck on the head eight weeks before, but beyond a slight scalp wound had apparently been uninjured. He gradually developed symptoms, however, and, although no signs of fracture could be made out, he was trephined in the region of the scar; but nothing was found, either in the dura or by exploration of the brain. He recovered from all his symptoms. Chavasse [243 Sept.] operated upon a man who had hystero-epilepsy as a result of an old fracture of the skull. The dura mater was found adherent to the bone. This was liberated and the patient improved, and was still well some months later.

De Renzi [557 Jan.] reports a case under the care of Stewart, of trephining for a depressed fracture one and a half inches to the left of the sagittal and about one inch posterior to the coronal sutures. The injury had been caused by a blow many years previously. The patient had been unable to do any work for three or four years, could walk only with difficulty, owing to dragging and loss of power in left leg, and also had progressive loss of power in the right arm and hand; had constant headache and occasional vomiting. Trephining was performed over the region of the cicatrix, and the bone was found much thickened, and was removed to the extent of two and a quarter inches in diameter. Patient made a complete recovery. The second case was a patient under the care of Ovenden, who received a compound comminuted fracture of the skull from a horse's kick. Trephining was at once performed, and she made a perfect recovery.

SHOT WOUNDS OF THE BRAIN.

Morgan [56 Sept.] has invented a new method for locating the bullet in gunshot fractures of the skull. This instrument is simply an inflexible meridian whose distal pole corresponds to an exit

wound when the proximal pole is placed upon a properly-introduced searching-probe. The trajector is composed of a solid bow of steel, in the end of which is a movable rod. The opposite end has a triangular groove on the under surface, so that it will accurately adjust itself to a search-probe of any diameter. The probe (preferably Fluhrer's aluminum) is allowed to gravitate in the track of the wound until the depth and direction of the latter are ascertained. While steadying the probe in this position, the trajector is placed upon it, and the movable rod pushed inward until it touches the scalp, when the point will indicate the proper point for trephining.

Huhn[112 May] has completed the tabulation of the reported cases of foreign bodies in the brain, and, from the study of these 423 cases, reports that 199 died, 224 recovered. Of the 199 that died, the foreign body was removed in 48 cases; in the remaining 151 cases the foreign body was left in the brain. A larger mortality percentage is found in those cases where operative interference was not resorted to, as the following figures show:—

Died, 199—body removed in 48, or 24.2 per cent.; body not removed in 151, or 75.8 per cent. Recovered, 224—body removed in 113, or 50.4 per cent.; body not removed in 111, or 49.6 per cent. In the 224 cases of recovery the figures as to removing the body are about equal, showing slightly in favor of removing the body.

The mortality from a foreign body in the anterior cerebrum is 38½ per cent.; in the middle cerebrum, 41½ per cent.; in the posterior cerebrum, 43 per cent. No case of foreign body in the cerebellum recovered. Of the 286 cases of balls in the brain here reported, 143 recovered, and an equal number (143) died, making a mortality of 50 per cent.

Of those that recovered, the ball was removed in 56, or 39.1 per cent.; it was not removed in 87, or 60.9 per cent. Of those that died, the ball was removed in 112, or 78.3 per cent.; it was not removed in 31, or 21.7 per cent. Of the 168 cases operated upon, 112 died, 56 recovered, or a mortality of 66⅔ per cent. Of the 118 not operated upon, 87 recovered,—a mortality of 26.3 per cent. But, since antiseptic surgery, 60 cases have been reported, with 24 deaths, or 40 per cent., and 36 recoveries, or 60 per cent. Of these 60 cases, the ball was removed in 24; 20

recovered, 4 died, or a mortality of $16\frac{2}{3}$ per cent. In 36 the ball was not removed; 20 died, 16 recovered,—a mortality of $59\frac{5}{9}$ per cent.

There are noted 37 cases of cerebral abscess following the entrance of a foreign body to the brain. Of these, 34 died, 3 recovered,—a mortality of 91 per cent.

Nearly all of these cases of abscess were from injuries prior to the introduction of antisepsis in surgery. In those cases reported since the introduction of antisepsis there have been noted but few cases with cerebral abscess, while prior to it they were very common.

Buckshot wounds have been rare of late years, only one being reported since the days of antisepsis. Wounds from breech-pins have occurred in 16 cases; 11 recovered, 5 died. The pin was removed in 12 cases, and all recovered but 1. The very low mortality in these cases of the imbedding of large, unequal masses in the brain seems extraordinary, but is explained by the facts: (1) that portion of the brain is affected which best stands traumatism; (2) the comparatively slight penetration as compared with a bullet; (3) the large external opening, hence free drainage; (4) the prompt extraction of the foreign body. In all of these cases strict antiseptic precautions were observed, and cold compresses were applied to the wound after the operation. This treatment proved to be most efficient.

Knife-Blades and Similar Instruments.—Twenty-seven cases are reported under this heading; of these, 17 recovered, 10 died,—a mortality of 37 per cent. The body was removed from 19; of these, 14 recovered, 5 died,—a mortality of about 26 per cent. Of the 8 cases in which the body remained, 3 recovered, 5 died,—a mortality of 75 per cent. The foreign bodies here were: knife-blades in 22, arrow-heads in 5 cases. From these injuries there followed three cerebral abscesses,—one following an arrow-head, the other two resulting from knife-blades.

Bone-Fragments.—Under this heading are 23 cases, all of which have been reported since antiseptic surgery was introduced. Of these 23 cases, the foreign body was removed in all; 20 cases recovered, 3 died,—a mortality of 13 per cent. It will be observed that the results here are most satisfactory; and, when we consider that all were treated antiseptically, we cannot but praise that very

important factor in surgery, especially in brain-surgery. The good results in these cases show that, if they are taken in time and treated properly, the prognosis is favorable.

Nails, Wires, etc.—In this class of foreign bodies there are tabulated 9 cases. Of these 9 cases, the body was removed in 6 cases and not removed in the remaining 3. Of the 9 cases, 7 recovered, 2 died; mortality, $23\frac{1}{3}$ per cent. Of these cases, 4 were pre-antisepsis, of which 3 recovered, 1 died; 5 were post-antisepsis; 4 recovered, 1 died. Of the 6 cases in which the foreign body was removed, 4 recovered, 2 died. The 3 cases in which the foreign body was not removed all recovered. The instruments or foreign bodies were: nails, 4 cases; wires, 3 cases; and metal rod, 2 cases. The 2 deaths followed the imbedding of a nail in the brain.

Miscellaneous.—Under this class will be found all kinds of bodies which cannot well be classed under a separate heading. Thirty-four cases have been tabulated; 13 recovered, 21 died; mortality, $61\frac{3}{4}$ per cent. The foreign bodies included in this list were a ferrule of a cane, a piece of ramrod, ferrule of an umbrella, splinter of wood, stem of a pipe. Cerebral abscess was present in six cases. It is evident that operative treatment should be employed whenever practicable. Of the one hundred and seven cases collected since Wharton's paper, the mortality following expectant treatment was 56 per cent.; that following the operative, 25 per cent. Mortality prior to antisepsis, 34 per cent.; since that time, 20 per cent.

For the treatment of a foreign body in the brain, from the statistics on the subject, the following are advised: 1. Gentle probing, to detect the presence of the foreign body; no force is to be used. 2. Removal of the fragments about the wound of entrance and thorough disinfection of the latter. 3. Avoidance of prolonged and elaborate search, should the bullet not readily be found. 4. Drainage and the application of a most careful antiseptic dressing. If there be any bleeding, this can be controlled by an antiseptic iodoform-gauze tampon, which will, at the same time, serve very well for drainage. 5. After a careful antiseptic dressing apply cold to the head. Open the jugular and bleed, in case symptoms of encephalitis develop and are not controlled by careful irrigation and redressing. 6. Place the patient at absolute rest; give a light and nutritious diet,—stimulants, if necessary.

Ruth [61 Aug.20] reports three cases of gunshot wounds of the brain, and gives the results of an interesting study of the means of probing for bullets and their angle of reflection, when they pass completely through the brain, impinging on the skull at some point distant from the point of entrance. He disagrees with Fluhrer's statement that bullets will rebound under these circumstances, and says that a ball will only rebound which is flattened at least one-third, and a velocity which will produce one-third flattening will nearly always produce penetration of the skull. If the ball strike at right angles to the surface, or within 15 degrees, and does not penetrate, the missile will probably lodge at the point of impact, or within one-half inch of that point, and will but rarely rebound. In rare cases they re-penetrate the brain after striking the opposite bony wall, but they almost invariably do it by glancing from the point of impact at angles to the angle of incidence of more than 90 degrees. In regard to probing the brain, he says: "There can be no excuse for thrusting a probe in any direction through normal brain-tissue, in the search for a ball. If the probe be of proper size and shape, it will give a definite and readily appreciable resistance before making a false passage." After a careful test of many sections of brain, in which post-mortem changes had not softened it, and no hardening fluid had been used, it was found that a hemispherically tipped probe, of one-fourth inch diameter, required from two and one-half to three ounces weight to produce penetration, and one and three-fourths to two ounces to cause it to pass between the convolutions. This sized tip is sufficient to use in following any ball from thirty-two calibre upward, with a resistance to penetration that a very unskilled touch ought to appreciate; and if he cannot, he can hang on weights within safe limits, or abandon the case to some one better suited to the work, instead of trusting to his extremely uncertain touch. A three-sixteenths of an inch probe will require, under the same conditions, from one to two ounces weight to cause penetration of sulci or normal cerebral tissue, and will answer for all the small rifle-balls, but both should be porcelain tipped for obvious reasons, and be carried by a small aluminum shaft, so as to give the least possible weight to the probe, and as slight lateral friction as possible to the collapsed canal, that all the resistance can be appreciated by the hand

manipulating the probe, and not to be compelled to take up an appreciable part of it in resisting weight, and to have, as nearly as possible, all of the resistance at the probe's tip.

Poirier $^{22}_{\text{July 13}}$ presented a patient who was operated on successfully for an intra-cranial lesion. A boy aged 14 shot himself in the left temple with a revolver. The same evening the skull was largely opened at the entry of the ball, a flow of blood and cephalo-rachidian liquid ran through the wound, and Poirier, passing his finger into the lateral ventricle, was able to feel the projectile, which he drew out with a hæmostatic forceps. The boy made a rapid recovery. Somers $^{147}_{\text{Apr.}}$ operated on a boy who was shot with a parlor-rifle, an inch to the right of the median line and just within the hairy portion of the scalp. The inner table was found to be fractured for at least a half-inch beyond the edge of the opening in the outer table. All fragments of bone were removed and the rough edges smoothed off. During the operation much clotted venous blood, mixed with a considerable quantity of broken-up brain-matter, was discharged through the opening in the dura mater. The wound was now explored with a bullet-probe, which was allowed to find its way along the passage; after entering about three inches it stopped. The bullet could not be felt by manipulating the probe, and, deeming further expedients useless, the wound was dressed. In a day or so after the sutures were removed a pulsating meningo-cerebral tumor, covered with bright-red granulations and about as large as a walnut, gradually formed and protruded from the wound. From this time on the progress of healing was uninterrupted. The granulations gradually receded within the cicatrix, and one month after the accident were no larger than a small pea. Not the slightest mental or physical symptoms had supervened.

J. Drzewiecki, corresponding editor at Warsaw, reports two cases of Radojewski's, of revolver-shot wounds, the first in a girl of 3 years of age, who was shot in the left orbit, injuring the eye, piercing the upper wall of the orbit, and passing out through the left parietal bone. She made a complete recovery, no signs of the cerebral injury except the scars being left. The second case was a man, who was injured over the frontal region by a piece of metal from an exploding tube. Pieces of bone and wadding were removed from the brain. Unconsciousness lasted almost a month,

and an abscess developed which discharged through the left ear more pieces of bone and wadding. For another year the patient was mentally unbalanced, but he finally recovered.

Wills [121 Feb.] reports a case of pistol-shot wound about an inch above the eyebrow. Spiculæ of bone were driven into the brain, and the bullet was found imbedded fully an inch and a half in the right frontal lobe, directly backward from the depressed bone. This operation was done without an anæsthetic, although the patient was conscious. He recovered. Bradford [99 Dec. 3, '91] reports a case in which the bullet had struck the skull, had fractured the outer table and inner table, and penetrated the latter. It had turned a half-revolution, so that its butt-end lay on the dura. The bullet was removed, and a complete perforation of the bone down to the dura discovered, but without wound of the dura. The patient made a rapid recovery. The case illustrates the lack of reliability of the probe as a means of exploration, without preliminary trephining, as the position was not discovered until after dissection of the flap of the skin covering the wound. It also shows the remarkable fact that a pistol of good size, placed against the parietal region, may force a bullet through the skull without penetrating the dura, leaving the bullet in contact with the dura with—what is still more remarkable—a complete revolution of the bullet in nearly its own axis, from the point of impact to the point of rest.

Walker [2 Mar. 12] reported the case of a man who was found bleeding from the mouth, nose, and left ear, his left eye closed by the swollen, ecchymosed eyelids, a ragged bullet wound at the back of the hard palate, immediately to the left of the middle line, and on the top of the head a puffy swelling, through which fractured bone could be felt. The fractured bone was removed, and the bullet was found lying below some clots and lacerated brain-substance. The fourth day after the operation suppuration at the back of the orbit commenced, displacing the eye forward and downward, the temperature rising to 101° F. (38.3° C.); the patient became delirious, obstinate, and troublesome. On the eighth day the abscess discharged itself upward through the wound in the head, the eye gradually returned to its normal position, the delirium abated, and the patient made uninterrupted progress toward recovery.

FRACTURES OF THE BASE OF THE SKULL.

White [112 Oct.] treated two cases of fractures of the base of the skull by spraying the external auditory meatus every two hours with bichloride solution and peroxide of hydrogen, and applying a general antiseptic dressing. The pharynx and nasal passages were also sprayed with peroxide of hydrogen and the nostrils plugged with iodoform gauze. Absolute rest in bed in a darkened room was enjoined, an ice-bag applied and calomel administered. Both cases recovered. Mothersole [6 Sept. 24] reports the case of a man who, while taking a barrel of whisky down some steps, slipped and fell forward against the steps, the barrel rolling over his head. He did not lose consciousness. The next day a copious discharge of clear, serous fluid came from the left ear, continuing to drain away for a couple of days. There were some twitchings of the left leg and right arm, and, some days later, paresis of the left facial muscles. A month later he was apparently quite well, except for a slight weakness of the muscles of the left side of his face.

Wyman [339 Dec., '91] reports the case of a woman who received a fracture of the left side of her head, crossing the base of the skull. Symptoms of compression were marked, and, on removing a button of bone, arterial hæmorrhage was discovered, which was stopped by ligation of the middle meningeal artery. Considerable clotted blood was evacuated, and the patient died an hour after the operation.

Mitchell [779 Apr., May] gives the results of his study of a series of 300 cases of injuries to the head. Of the 80 cases of basal fracture, 21 recovered and 59 died. Autopsies were made in 26 of the fatal cases. The injuries giving rise to these fractures were all very severe in character,—falling considerable distances, being struck by locomotives, or by falling bodies of various kinds. As regards the length of time elapsing before death, 39 cases, nearly 50 per cent., died during the first twenty-four hours, 7 cases in the second twenty-four hours; the remaining cases, 13 in number, died at various intervals, from three days up, one case living for a month. The line of fracture was confined to the anterior fossa in 2 cases, to the middle in 9, to the posterior in 2. In 2 cases the anterior and middle fossæ were both involved, in 9 the middle and posterior, in 1 case all three fossæ.

These figures show, as usual, the preponderance of the middle fossa as a site of fracture. Hæmorrhage from the ears alone occurred in 13 recoveries and also in 13 fatal cases. It came from the right ear 12 times, from the left ear 11 times, and from both in 3 instances. Hæmorrhage from the nose alone in 2 fatal cases, from the nose and ears combined in 8 recoveries and 17 fatal cases (several of the latter had hæmorrhage from the mouth also), from the nose and the mouth in 4 of the deaths. In the remaining 23 cases, hæmorrhage either is not noted or is stated to have been absent. In 2 no hæmorrhage is noted, yet the autopsy showed fractures of the base in both cases. Subconjunctival hæmorrhage was present in 1 recovery and 8 fatal cases. Ecchymosis into the cellular tissue of the eyelids in 3 recoveries and 5 deaths. Exophthalmos from hæmorrhage into the cellular tissue of orbit in 6 fatal cases. Cerebro-spinal fluid escaped in 1 recovery and 4 deaths; brain-substance in 2 fatal cases. Injuries to the cranial nerves do not seem to have been frequent. Impaired hearing was observed in 1 case, squint and ptosis also in 1, and facial paralysis in 5 (1 fatal case and 4 recoveries). The pupils were equal in 7 recoveries and 6 deaths, unequal in 6 recoveries and 16 deaths; dilated in 2 recoveries and 11 deaths; contracted in 2 recoveries and 7 deaths. In 4 recoveries and 19 fatal cases their condition is not recorded. As regards their mobility, they were mobile in 4 recoveries and 4 deaths, fixed in 10 fatal cases. In 17 cases of recovery and 45 of death, this feature was not noticed. The patients were conscious on admission in 7 recoveries and 1 death, unconscious in 11 recoveries and 43 deaths. Condition not stated in 3 recoveries and 15 fatal cases. Paralysis other than facial was present in 1 recovery and 6 deaths. Not present in 12 recoveries and 5 deaths. Not noted in 4 recoveries and 46 deaths. As it seems probable that recovery may occur when these basal fractures are not extensive, treatment was directed to the prevention of infection. The external auditory canals were thoroughly cleansed by irrigation with boric-acid solution, peroxide, etc., then plugged with iodoform gauze; in some cases the nose also being treated in this way.

Devereux [6] Dec.26,'91 reports the following case of fracture of the middle fossa of the skull, in which the application of leeches relieved the pain in the head. A boy 16 years of age fell backward,

striking the back of his head against a wagon-wheel. He became unconscious and had profuse hæmorrhage from the nose and both ears, and considerable oozing from the top of the pharynx. He became conscious some hours later, when he complained constantly of his head, particularly the right side. He developed a slight convergent squint of the right eye. Nineteen days after the injury he was discharged cured, but there was no return of power in the external rectus of the right eye.

Fletcher [242 May] trephined for paralysis of the third nerve in a patient who had received a traumatism about the centre of the right half of the frontal bone. A one-inch trephine was used, the lower and outer edge of the saw resting on the superciliary notch. Continuing through the posterior wall of the sinus, the lower edge of the opening was just on a level with the orbital plate; the dura was slit transversely and lifted, showing a fracture line in the plate. There were evidences of thickening of the dura, with slight exudation of jelly-like plasma under it. The brain did not appear unnatural in color or in motion, and no evidence of tumor or abscess presented. The intense headache disappeared at once, and two years after the operation the patient was reported to be as well as ever.

EPILEPSY.

"What Can We Expect from the Surgical Treatment of Epilepsy?" forms the title of a paper by Sachs, [1 Feb. 20] who says: "In a given case of traumatic or organic lesion, operate as early as possible, to prevent the development of secondary sclerosis; if you have not operated at the outset, the onset of epilepsy is a warning that secondary sclerosis has been established. By operation at this time you may avoid an increase of the trouble. Excision of the diseased area is the only rational operation. If all the other centres are not in an irritable condition, the operation may be thoroughly successful. Traumatic cases call for immediate surgical interference; traumatic epilepsy should be prevented as far as possible; it will be easier to prevent than to cure it. Simple trepanation seems to be more successful in the epilepsies associated with infantile cerebral palsies than in the traumatic forms, probably because of the greater frequency of cysts in these cases. Early diagnosis is important, and operation should be done be-

fore secondary degeneration is established. In children excision of a centre is less serious than in the adult." The surgical treatment of epilepsy forms the subject of a paper by Joseph Price, $\frac{242}{\text{June 10}}$ who states that hystero-epilepsy is, for the most part, confined to females of a marriageable age. If, in any female epileptic, well-marked pelvic disease of any kind can be demonstrated, the pathological condition should be removed,—surgically if necessary, medicinally if possible.

Ovariotomy is justifiable, even where pelvic disease is doubtful, in unmarried women in whom every menstrual period is marked by an epileptic seizure, but who are free from the attacks at other periods, and recover from them as soon as menstruation is over. Attacks of dysmenorrhœa accompanied by epilepsy, where every other treatment has failed, should be treated in the same way. Out of nine cases so treated, all but one were cured, and in this one it was doubtful whether the operation was complete. In the discussion on this paper before the New York Neurological Society, Hammond $\frac{242}{\text{Apr.}}$ considered that abnormalities of the uterus were more potent in the production of epilepsy due to the genitals than abnormalities of the ovaries. He had made an investigation as to the relief of epilepsy and insanity by removal of the ovaries, and found the consensus of opinion was negative. He had seen four or five cases of epilepsy and hystero-epilepsy originate a few days after ovariotomy, and had seen some cases cured by the removal of uterine irritation, but had never seen such results follow ovariotomy. Buckmaster considered that ovariotomy in the conditions under consideration should be condemned.

Ricketts, $\frac{53}{\text{Feb.27}}$ of Cincinnati, gave the subsequent history of a case of epilepsy in which he had performed abdominal section for the removal of "pus-tubes" two years before. At first the epilepsy was benefited, but finally the attacks became harder, not yielding to any plan of treatment, and finally terminated in death. Johnstone, in the same discussion, reported a case in which the removal of the uterine appendages was a relief; but he does not consider that the operation alone will cause a permanent cure,—the menopause must be brought on. He does not consider that confirmed epileptics should be operated upon in this way.

Caselli $\frac{589}{\text{Nov.2,'91}}$ reported to the Italian Surgical Congress four cases of trephining for traumatic epilepsy. The first was a boy of 17

years, who had been injured when 7 years of age, and who had cortical epilepsy localized over the whole right motor zone, and especially at the base of the right ascending frontal convolution. His attacks came on every ten days (fifteen days in summer), when he was suddenly seized with intense vertigo, screamed, and fell. He lost consciousness, and remained in this condition for two hours. On recovery he had nausea, intense headache lasting half an hour, and was excitable, exacting, and threatening; often taciturn, reserved, and walked up and down the room, paying no attention to company. Had a ravenous appetite, and ate voraciously of the coarsest food. There was hemiparesis of the muscles of the left half of his face. In the right parietal region there were two linear scars, nearly parallel and about three centimetres apart, running obliquely downward and forward. Inspection and palpation revealed a depression corresponding to these scars.

A trephine of four centimetres in diameter removed a button of bone, on the internal face of which there was a fissure, evidently the remains of an old fracture. Two bony fragments, one above the other, were also removed. The internal surface and margins of the disc having been smoothed off, it was immersed in a 1–2000 solution of sublimate at 40 degrees. Eleven small pieces of bone were removed with Hoffman's forceps.

Palpation of the dura mater revealed a softened area which was suspicious of, but not diagnostic of, fluctuation. An aspiration with a Pravaz syringe revealed only subarachnoid fluid. The bony disc was replaced, the periosteum reunited with catgut sutures, and the cutaneo-muscular structures with silk.

There were no after-complications. Pulsation continued in the operated region for twelve days, but the wound healed by first intention. In twenty-four hours improvement was noted, and the patient remained under observation for six months and had only two slight attacks; his general health improved steadily.

The second case was one of cortical epilepsy of traumatic origin in a woman 25 years of age, who was struck, when 7 years old, in the right parietal region, a wooden peg remaining imbedded in the cranial cavity for some minutes. Immediately following the accident she experienced a pricking sensation, which never disappeared. Her first attack of epilepsy occurred two years

later, and she had recurrences, of varying severity, every four or five months, until, finally, they became more frequent and of longer duration. Examination revealed a depressed scar, about three centimetres from the sagittal suture, apparently without bone between it and the brain. Following the direction of the right fissure of Rolando a large incision was made, and the break in the bony vault was laid bare. This was enlarged, and some fibrous tissue adhering to the dura was removed. The thermo-cautery not controlling the hæmorrhage satisfactorily, the wound was packed with gauze saturated in an antiseptic solution of cocaine, and the flap sutured. No convulsions were observed during the next six months.

The third case was also a woman, 19 years of age, with traumatic epilepsy localized in the motor centre of the left side. Ten years before she had received a severe contusion over the occiput. Her first convulsion occurred four years later. The dura was found distended and adherent to the cranial vault, corresponding to the lower part of the motor zone.

Incision of the dura revealed five miliary nodules under the arachnoid. On opening this latter membrane a quantity of serofibrinous fluid escaped (circumscribed leptomeningitis). The patient had infrequent and slight attacks during the following four months.

The fourth case, a woman 21 years old, received a traumatism during infancy. She had frequent epileptic attacks localized in the right motor zone. Four oval osseous plates, about eight millimetres wide and twelve long, were found pressing on the dura and removed. During the next four months there were no attacks.

Taussini also reported a case of trephining for epilepsy in a man who had his first attack when 18 years old. This patient had a marked asymmetry of the skull, which was characterized by an increased height in the frontal bone on the right side; on the left there was a depression.

A projection was also present on the right which corresponded to the coronal suture. Behind the raised portion of the bone there was a transverse furrow, about six centimetres long, in which distinct pulsations were seen. The large gap was plugged with iodoform gauze and the wound closed. During the five months following the operation the patient remained well, and

became docile and quiet. Some slight but very short attacks were followed by their complete disappearance. None were observed for two months.

Postemski $\frac{589}{\text{Nov. 2, '91}}$ reports a case of cortical epilepsy in a young man of 24 years, who had daily convulsions, with cyanosis of the face and other symptoms, lasting about a minute. The trouble having been localized in the cortico-motor centres for the upper and lower limbs, an incision was made and the cranium opened to an extent of four by two and a half centimetres, near Rolando's fissure. The diploë was wanting in this portion of the skull, but the dura appeared healthy. Heat (60° C.—140° F.) placed in contact with the dura caused excitement,—first of the opposed limbs, then of all four, and then of the right limbs, as in one of his attacks. This patient was apparently worse after the operation, and is to be operated upon again, when it is proposed to excise the cortex after the method of Horsley.

Södenbaum $\frac{68}{\text{Sept.}}$ also reports a case of traumatic epilepsy in a man, 19 years of age, who was struck on the head by a falling tree when 5 years old. Three years later he began to have epilepsy. There was a depression on the head about six and a half centimetres above the left mastoid process, extending upward for five and a half centimetres. This scar was five centimetres wide at its lower part and three centimetres at its upper extremity. There was also a bony defect corresponding with the depression, and a constant pulsation was observable. The pia was œdematous, but the cerebral substance appeared normal. Severe attacks followed on the three following days after the operation. He had an attack of epilepsy in the ninth and another during the tenth month following the operation. Hochenegg $\frac{8}{\text{Mar. 17}}$ reports two cases: the first, a man, aged 30 years, who was injured by a fan when 7 years of age, but who did not develop epilepsy until his seventeenth year. The attack was confined to the left side. For two years these attacks appeared as many as twenty times or oftener in the day; then he had an interval of six years when he was free from any attack, but when he was twenty-five they returned again more severely than before. He was treated for three months and improved. Five years later the attacks were more frequent (thirty per diem). On the convexity of the right parietal bone, four centimetres from the sagittal suture and thirteen and a half centimetres from the external

auditory meatus, there was a spot about the size of a dove's egg, very sensitive to pressure, and running through the centre of this sensitive area there was a groove in the bone. There was slight facial paresis; the left upper extremity was weaker than the right, and generally paretic; there was only slight mobility of the fingers, but free motion of the hand. Skin and muscle reflexes were extinct; sensibility and temperature normal; left lower extremity, also, weaker than the right; muscular power markedly decreased. Attacks began with severe pain in spot over parietal bone, then flexor convulsions of the left upper extremity, followed shortly by a like condition in the lower extremities, and finally the right side was involved in the clonic convulsions, but to a less degree than the left. During a mild attack the left side alone was affected. As the area affected corresponded to the location of the motor zone for the upper extremity, the case was considered one of Jacksonian epilepsy, produced by depressed bone. The bone was found much thickened at the injured spot when trephined, and a button the size of a dollar was removed, and a tumor of the size of a walnut was discovered and excised. The brain-substance appeared to be normal. There were no further attacks after the operation, and paralysis entirely disappeared for one month, when a slight twitching was noticed in the left upper extremity, and on the 1st of June he had a typical seizure. He then had as many as twenty-two per diem. A hernia cerebri developed, which was punctured, with the expectation of finding an abscess, but only a few drops of serum oozed out. Improvement was remarkable; and as the old condition returned, several punctures were made, but the relief was only temporary. Consequently, the whole hernia was shaved off. The attacks subsided after a month, and for eighteen months he has had none.

Kennedy [121 July] trephined a child of 6 years who had had epilepsy from the time he was 6 weeks old, in whom there was apparently no history of injury, and yet a spicula of bone was found projecting into the brain. This child could only mutter sounds, was paralyzed on the left side, and often had as many as thirteen convulsions in a day. Excepting one attack, twelve hours after operation, the child has had no return for nine months.

Girard, of Grenoble, [3 Apr. 23; 22 May 4] related the case of a woman who, because she could not get cured of epileptic fits, shot herself

in the head with a revolver. Carried to the hospital, he trephined the skull and was fortunate enough to remove the ball, but, curious to say, the epilepsy disappeared also, and for the last six months the woman has had no symptoms of a return.

Kümmell [69 June 8; 2 July 9] records four cases in which trephining was practiced over definite tender spots with a longer or shorter cessation of the fits and with considerable mental improvement. A further case, however, died in consequence of the operation. Kümmell says that the results in such cases of idiopathic epilepsy cannot be looked upon as very satisfactory, and doubts whether any case has been really cured. Cortical or Jacksonian epilepsy, almost always traumatic in origin, is the most important in regard to surgical treatment.

Mills and Keen [5 Dec., '91; 2 Feb. 13] put on record a case in which trephining was practiced on a woman, aged 27 years, for the relief of severe Jacksonian epilepsy of non-traumatic origin. On removal of a disc of thick and hard bone over the fissure of Rolando, at a distance of one and three-fourths inches from the median line, a small growth was exposed which projected about a quarter of an inch above the surface of the dura. After removal of a triangular piece of dura, including this growth, a portion of the cerebral cortex, three-quarters of an inch in diameter and comprising all the cortical gray matter under the tumor, was excised. This was done in order to make a subcortical exploration for any further lesion, and also to prevent the recurrence of the spasms by removing what seemed to be their primary seat. The patient recovered from the effects of the operation, and on the thirty-third day had regained all movements of both limbs, and was able to walk. The results of the surgical treatment were, however, with regard to the epilepsy, unsatisfactory, although the convulsions never attained the severity or frequency of those observed for a short time prior to the operation, The removed growth, which had apparently originated in the pia and perforated the dura, presented under the microscope the characters of sarcoma. It is suggested by Mills that the persistence of the epileptic attacks in this case might be due to the presence of sarcomatous growths or infiltrations elsewhere in the brain.

Whipple [2 Apr. 30] operated upon a most interesting case of epileptiform convulsions following an injury to the head. These convul-

sions were always general, there being no marked twitching or spasm of one set of muscles before another, but there was always marked tenderness over the scar of a scalp wound. At the operation there was no great depression of bone or collection of fluid, but the dura mater was thickened and very adherent to bone, not allowing the pulsation of the brain to be seen,—the result, no doubt, of inflammatory thickening. There was no bulging as if there was increased intra-cranial pressure, but the removal of bone must, in some way, either have relieved increased intra-cranial pressure, or else have removed something which acted on the brain as an irritant.

Paliard [211 July 10] gives the history of a case of Jacksonian epilepsy in a man of 50 years, upon whom trephining was done by Jaboulay, seven buttons of bone being removed along the level of the fissure of Rolando. There was an escape of a large quantity of cerebro-spinal fluid. The difficulties of speech were improved, but the epilepsy remained the same. Pershing [242 Aug.] also reported a case of Jacksonian epilepsy, in which the convulsions began in the left orbicularis palpebrarum, and extended to the left hand and arm, in which an apoplectic cyst was found beneath the upper face centre and drained. This patient has remained well five months.

Baines [187 Jan.] operated upon a man of 46, who had epilepsy following a fall about six months before. A disc of bone was removed over a tender area in the scalp, the seat of the old contusion, but no evidence of old fracture with depression, no sclerosis of the skull, or any other cause for brain irritation could be made out. He made a perfect recovery and the epilepsy disappeared. For some nervous symptoms which continued he was hypnotized, and after a fortnight's treatment in this way he became perfectly well.

Darby [647 Mar.] trephined a young man in 1884 who had been subject to epilepsy for three years, and who had a depressed cicatrix nearly an inch long over the middle portion of the left parietal bone, caused by a stick falling on him when he was but 4 years of age. The dura was found adherent to the bone, but nothing else could be discovered. At first and for several months he felt the aura and giddy sensations, which grew lighter until they disappeared, some years ago. J. T. Binkley, Jr., operated upon a man, 37 years of age, who had been injured in the head with a

hatchet in 1875. He had convulsions following this, and in 1883 Bevan removed a few small pieces of bone, which relieved but did not cure him. In 1885 Sheminick removed a few more fragments, which gave entire relief until the latter part of the same year, when he was struck on the head by a falling telephone pole, and suffered from a return of the convulsions. He had a rectangular depression of the skull over the left frontal region. A small opening in the skull was found, to which the periosteum was firmly adherent. This opening was not large enough to allow the use of the rongeur forceps, and a button of bone was removed with the trephine, revealing a depression of the inner table of the skull and a fibrous thickening of the dura. The bone was unusually hard. The wound suppurated, but finally healed, and the patient has had no recurrence of his epilepsy.

Reese, $\frac{101}{\text{June}}$ in the case of a young man, 21 years of age, who had received a penetrating wound from an axe directly on the top of the head, and who had suffered from epilepsy, beginning four years after the injury, removed a disc of bone, including the depressed portion of the skull, eight years after the receipt of the injury. The bone was thicker than normal, and a celluloid plate was inserted. Three days later he had a convulsion, and the following day struck his head immediately over the cicatrix, causing great pain and tumefaction, followed by violent delirium and elevation of temperature. One margin of the wound, which had completely healed, was re-opened, and the plate was found to be displaced and was consequently removed. There was no recurrence for three months.

McCosh, of New York, $\frac{1}{\text{Jan. 9}}$ presented a boy, 7 years of age, who, on August 11, 1890, had fallen down-stairs, and had been found in a semi-comatose condition. The diagnosis had been that of pressure by clot on the motor centre for the left arm, face, and leg, in the posterior and anterior ascending convolutions. Operation was performed, and, after thorough removal of clot and *débris*, the scalp was sutured over a drainage-tube. Some slight movements took place in the paralyzed left arm as the boy came from under the anæsthetic. In twenty-four hours movements became pretty general over the affected areas. In three weeks motion was complete, and, in six weeks, of normal strength. The patient became perfectly well and so remains. There is at present no inconvenience of any kind.

Heuston [16 Mar.] read a report of a case of traumatic epilepsy, aphasia, and paralysis, of six years' duration, treated by trephining, before the Royal Academy of Medicine of Ireland. The patient was a man, 30 years of age, who was injured by being thrown from his horse and dragged some distance. He had a triangular scar in the left occipital region, above which there was a circular depression of the skull about one-half inch in diameter, corresponding in position to the second annectant convolution of the brain. The bone was very thick; the diploë was absent, but there was no evidence of depression of the inner table. The dura was thickened, had lost its lustre, and bulged into the wound. There was no pulsation of the exposed brain; needle-puncture removed some subdural fluid, which continued to escape, and the pulsations returned. His improvement had been continuous for ten months.

McLean is reported by Hankins [82 June 27] to have operated upon a man, 32 years of age, three different times, with benefit each time.

Hamilton [6 May 7] reports the following case: A boy, 12 years of age, suffering from epilepsy, had been struck with a stone on the forehead four years previously. On examination, something hard, but movable, was discovered under the cicatrix on the forehead. Previous to his epilepsy there was a sharp pain felt in the spot. On cutting down upon the hard substance, a piece of slate was found firmly imbedded in the tissues. This was removed by excising the surrounding tissues widely. The boy was under observation for twelve months, during which time there were no further attacks.

Dickinson [82 Nov. 14, '91] reported a case of a young man, who, when a boy of 6 or 7 years of age, was kicked upon the head (locality not known) by a horse. When 25 years of age he had occurrences of loss of consciousness, at first for an instant only, but subsequently these periods were lengthened. When about 30 years of age he was operated upon by trephining, over the site of the original injury, and a button of bone removed. Immediately upon its removal a protrusion of the meninges took place. This proved to be a cyst containing a large collection of pus. He was greatly relieved, made a good recovery, and remained entirely free from any return of the epileptic attacks for nine months; they then returned, in a slight degree at first and at long intervals, afterward more frequently. This condition continued for a year or two, when they

totally disappeared. He has had none for twenty years, and has remained in good health.

Merz [202 Nov.25,'91] operated in the case of a young man of 18 years, who was kicked on the back of the head by a horse, causing a depressed fracture of the skull. About ten years after, he began to have epilepsy, which increased in frequency. A distinct depression of the skull, about two and a half inches by three-fourths of an inch, was made out near the superior angle of the parietal bone, corresponding to the line of the old fracture. The disc was adherent, and had to be dissected from the dura mater. Cerebral pulsation was normal. The dura was thickened, and dark in color. A sharp spicula of bone was found projecting into the dura. A second button was removed about three-fourths of an inch anterior to the first, and was also found to be adherent. The intervening piece was removed by means of the saw and rongeur forceps. On the seventh day the patient was allowed to dress and walk about the wards, and a week later was discharged as cured. Eight weeks after the operation he had no pain nor any symptom of an epileptic seizure.

Davis [106 Nov.,'91] gave the history of a patient, 22 years of age, who was struck on the head, when he was 7 years old, by a falling plank, fracturing his skull. When about 17 years of age, he began to suffer from epilepsy, and in 1890 it was decided to operate because he was growing worse. When the bone was removed, a sharp spicula about two lines in length was found projecting forward and adherent to the dura mater. This was removed, together with a portion of thickened dura one-third of an inch in diameter. At this point in the operation the patient had a severe epileptic attack, and he had another as he was coming out of the anæsthetic. All his symptoms improved after the operation, and seven months later he had no recurrence.

Briggs [120 Dec.,'91] reports the case of a boy of 12 years, who was kicked in the head by a mule when he was 3 years old, producing an irregular, lacerated, scalp wound behind the junction of the sagittal and coronal sutures. A marked depression of bone was noticed and there was a prolonged period of unconsciousness, and six months after the injury he was seized with a typical epileptic attack. Briggs states that out of fifty cases of traumatic epilepsy carefully selected for operation he has relieved the majority completely, and

some partially, a percentage of nearly 90 per cent. This patient had two seizures after the operation, but after that he had no others. He left the hospital in ten days.

Miles [6 Nov.21,'91] gives the histories of two patients with traumatic epilepsy which were treated by trephining. The first was a man, 42 years of age, who was struck on the top of the head three years and a half before being admitted to the hospital, and the cicatrix was always tender. Nothing was found at the operation to account for the condition, and afterward he had very frequent seizures for six weeks, when they ceased, and he has only had one in three and a half years.

The second case [6 Nov.28,'91] was a man of 35 years, who was injured four and a half years before applying for treatment. A button of bone was removed over a depression on the left side, a little above and in front of the ear. The temporal muscle was found divided into two parts by a dense, adherent cicatrix. The bone was normal, though somewhat thicker than usual. It was not depressed. Under the dura a translucent cyst-wall was found, which was very thin. There was a depression on the surface of the brain measuring about half an inch in every direction, but the brain-tissue seemed normal. The involuntary muscular twitchings in this case were increased by the operation, and about a year later he became insane.

Knapp and Post [99 Jan.7] report two cases of trephining for traumatic epilepsy. The first, a girl of 16 years of age, was struck in the forehead by a stone five years before entering the hospital. About four years later her convulsions began, and she was operated upon after all other measures had failed. A button of bone, the dura, a portion of adherent brain-substance, and as much of the cicatricial tissue as possible were removed. Some thickened connective tissue was left in close proximity to the longitudinal sinus, which could not be removed without cutting the sinus. Her convulsions continued after the operation, and when she was lost sight of, some months later, she was still epileptic. The other case was a young man of 18 years. When 12 years of age he was struck in the right temple, and in less than a year he began to have seizures. There was a faint scar, which was tender, over the right temple. A button of bone was removed, and almost directly beneath was found a marked bluish-white opacity of the pia, but the opacity

and the œdema extended in every direction under the edges of the trephine-opening; so that it was clear that the lesion was diffuse. He has not materially improved since the operation.

Pick [6 Nov.28,'91] has operated upon three cases of traumatic epilepsy, all of which terminated successfully. Manoury and Camuset [94 July; 6 Aug.2] record a case in which trephining was performed for epilepsy, subsequent to injury and a resulting depressed fracture. The failure of the operation goes to confirm the opinion, generally admitted at the present time, that the long duration of attacks and the appearance of dementia should serve as contra-indications of operation. A case recorded by Le Brun [288 Nov.1,'91; 90 Feb.] had the peculiarity that the epilepsy supervened a long time after a grave injury to the frontal bone, though no relation could be established between the seat of the lesion and the form of the epilepsy. The convulsions were general and presented the characters of true epilepsy, this being confirmed by Charcot, who carefully examined the patient and who witnessed one of the attacks. Charcot, from the want of success which had attended the use of bromide, advised the application of the trephine. This was practiced, but with only temporary relief, and later a second and more extensive operation was undertaken with a completely successful result. Chavasse [243 Sept.] reports a case of hystero-epilepsy following an old traumatism of the skull in a man of 21 years, who was injured, when 18 years of age, by a fall upon the left side of his head. Three months later he began to have nervous symptoms which increased in severity and frequency. Upon the left side of the head, toward the posterior parietal portion, there existed an irregularly-rounded cicatrix of about the dimensions of a two-franc piece. This was adherent to the bone, and bony depression was also present. The bone was adherent to the dura, which, after it had been freed from the bone, appeared normal and was not incised. Another button of bone was removed to make certain that all compression had been overcome. He was still well two and a half months after the operation.

Boubila and Pautaloni [100 May 10] report the case of a young woman of 23 years who had epileptic insanity. She had a depression in the skull, due to a fall when 6 years of age, and was exceedingly violent. Her mania was homicidal and suicidal. The lesions observed at the operation consisted simply of a thickening and

hardening of the internal table, with complete disappearance of the diploë. This corresponded to the external depression and was compressing the brain. The cure is reported to be complete. Benedict's $^{57}_{July\ 10}$ ideas upon the management of idiopathic epilepsy are worthy of record. The opinion that the skull is a stiff and immovable mass is erroneous; it is larger in summer than in winter, and enlarges after continuous work. Operative procedures which perforate the skull for the relief of pressure are not justifiable except in neoplasms, and it is also a mistake to perforate the skull for microcephalus, to allow of brain-development, because in these cases the cord is also aplastic, and after the perforation of the skull the cord is still unable to conduct afferent and efferent impulses. For years he has known that epilepsy can be suspected from the formation of the skull without any further history, and he questions the utility of removing a piece from one place when the whole conformation of the head showed a decided change. It is a remarkable fact that in many epileptics the convulsions start from a small area, and the general convulsions represent a radiation from this centre. Convulsions are only the motor symptoms of epilepsy, and the removal of a centre originating the motor disturbance should retard the convulsions, but never produce paralysis. Paralysis results rather from shock or other influence on the centres lying underneath. When the operation is carried out with great caution, so that no shock results, the patient rallies after a few hours, and there is an immediate change in mobility or in sensibility, which is a proof that the excluded centres had nothing to do with mobility. The convulsions after the operation may be a passing symptom from irritation of the neighboring cortex. The opening should be very small; the dura should be united by sutures; the periosteum should also be sewed. Should two centres be explored, a bridge of bone should be left between them.

Hochenegg $^{8}_{Mar.17}$ reported a case that had never suffered from traumatism, but had been subject to fits for seven years; they came on without apparent cause, and had become very frequent. The attacks start in the right upper extremity, then involve the right lower. The diagnosis was made of right-sided cortical Jacksonian hemiepilepsy, and the centre for the right upper extremity was suspected as principally diseased. The trephine-opening was

made in the left parietal bone; the dura was normal, the other meninges slightly opaque, and the brain microscopically normal. Faradic irritation proved that the opening was too high for the centre, only the fingers being affected by the current near the lower border; hence the removal of a second button when faradic irritation proved that the proper centre was exposed. The cortical portion of the brain corresponding to the trephine-opening was gouged out, and resulted in paralysis of the right upper and paresis of the right lower extremities and aphasia. This symptom lasted only eight days and then entirely disappeared. The convulsions at first were increased in number, then in a few days disappeared completely, and have remained away for about a month. The interest in this case centres in the cure of an epilepsy of spontaneous origin by trephining.

Engel [234 Sept.] relates the case of a boy who was in good mental and bodily health until the age of 6 years, when, without discoverable cause, he had convulsions following epilepsy. The fits became more frequent and severe until, between the age of 12 and 14 years, he had as many as twenty-one during the twenty-four hours. An operation was performed by Packard, who trephined on each side of the sagittal suture and removed the intervening bone. The operation was repeated on the opposite side of the skull three months later. For five weeks after the first and two weeks after the second operation he had no attacks, but at the time (not stated) of the report he was having one or two a week, but of a much milder type than before operation. A few weeks after the second operation his expression changed, and he became less irritable and much more intelligent. This improvement was progressive, and his mental condition became that of an ordinary, intelligent boy of 8 years; his age was 14 years. The bone removed at the operation was much changed, being chalky and very thick.

Holger Mygind, corresponding editor, Copenhagen, sends the report of three cases operated upon by Studsgaard, of Copenhagen. [371 v.1,No.18,'91; 673 Mar.] In the first case,—that of a man, aged 27 years, who, when 12 years old, had been exposed to an injury of the head,—nothing abnormal was found in the dura mater or the brain; the operation only improved the condition of the patient slightly. In the second case,—that of a young girl, aged 17 years, whose injury

was contracted seven years previously,—a detached, flat, small bone was found lying between the dura and the bone, and was removed; recovery followed. The third case is still under treatment; the patient, a man aged 24 years, exhibited a depressed cicatrix over the left eye. The epileptic fits were evidently caused by bony productions (osteophytes) of a depressed part of the frontal bone.

Carter [187 Jan.] reports a case of a woman, aged 30 years, who, when 17 or 18, had a sun-stroke, and finally became epileptic, suffered from uncontrollable headache, and on the day following her admission to the hospital had eighty epileptic attacks. A portion of the skull, about four and a half inches long by two and a half inches broad, having the upper portion of the right Rolandic area for its centre, its length lying parallel to the long axis of the cranium, was removed by connecting together a series of trephine circles by means of the forceps. The skull-cap was one-fourth of an inch thick, and there was no diploë. The dura was not opened, and only bulged to the level of the outer table of the skull. Only a very few weeks have elapsed since this operation, and although the immediate improvement has been marked, the woman having regained her intelligence and having had no fit, and although the headache has disappeared and memory is returning, some time must elapse before the value of the operation can be determined.

Morrison [2106 May 25] operated on a boy of 8 years who had had convulsions and epilepsy from the time he was 6 months old, and who had no history or indication of traumatism, but in whom the symptoms pointed so strongly to a localization that trephining was undertaken. No success followed the venture, however.

Chalot [3 Sept. 21] has returned to Alexander's operation, but modifies it by always ligating both vertebral arteries at one sitting. Ligature of one artery only, or of both at long intervals, has no lasting result. Another modification of Alexander's operation is the complementary and incomplete ligature of the two carotids. For ligature of the vertebral artery, incision is first made between the fasciculi of the sterno-cleido-mastoid muscle, and the objective points are the origin of the anterior scalenus muscle, the carotid tubercle of Chassaignac, the angular groove traceable by the finger, at the base of which is the vertebral artery, a vein lying on the artery, and, last, the hollow formed by the thyroid artery and its vein. The author has operated six times, with good results, except in one case, where

death occurred on the fourth day. Too little time has elapsed to judge of the therapeutic results; in some cases there is apparent improvement, and none are worse than before treatment.

Jamar [101 June] reports that in 1863 he treated a soldier who had received a gunshot wound at the battle of Gettysburg, which had penetrated the cranial tables, injuring the dura mater near the junction of the sagittal and coronal sutures, and who, while playing about the ward of the hospital, some time afterward, fell, striking his head. This at first stunned him slightly, but was soon followed by a violent convulsion, which was repeated at short intervals. To prevent his injuring himself further, Jamar seized his neck, pressing it firmly against the floor, so compressing the carotid arteries; there was an almost immediate cessation of the spasm, and the same result followed each time it was tried. He has employed the method with success since in other cases.

Von Jaksch [22 Sept. 21] has recently published a paper on the subject of section of the sympathetic nerve in epilepsy, apparently in ignorance that it had already been thoroughly worked out by an English surgeon, W. Alexander. He quotes Baracz's opinion that in Alexander's operation of ligature of the vertebral arteries the operation *per se* can have no effect whatever upon the disease, and that in those cases in which good results have followed they have been entirely due to accidental injury done to the sympathetic nerve in the course of the operation,—that, in fact, the injury to the sympathetic plays the chief rôle in the action of the operation. Believing this, he operated in two cases. The first patient had slight attacks in the night following the operation, and not another whilst under observation, close upon a year. The second had none for eight months after, when he passed from observation.

Bobroff [761 Bd. 8] operated upon a girl, 10 years of age, who fractured her skull in the posterior frontal region, and the removal of the fragments resulted in a triangular defect measuring three centimetres at the base, which was anterior, and six and a half centimetres to the point of the apex, which pointed posteriorly. After the operation her aphasia and hemiplegia improved materially, but finally she developed epilepsy of the Jacksonian variety. She also developed a scoliosis, with torsion of the vertebral column and feeble-mindedness. An osteoplastic operation was performed by first raising the flap corresponding to the bone defect and dissecting

it free from the dura. Tough adhesions being also found between the dura and the arachnoid, they were broken up. A second flap was then made by carrying an incision upward toward the median line through the skin and periosteum until it corresponded in length to the base of the bony defect. It was then continued toward the apex until only a small pedicle remained. The skin-flap, periosteum, and a lamella of bone reaching to the diploë were raised by means of a specially-constructed chisel and slipped into place over the opening in the skull. It was sutured in its position, and the newly-made opening down to the diploë was covered with the soft parts that had formerly covered the gap in the skull. A year after the operation the bone lamella was fast in position. Epilepsy still continued, but, together with the cerebral capacity and the disturbance of speech, it was markedly improved.

Weinlechner $\frac{8}{\text{May } 20}$ reports the case of a boy, employed in a factory, who had his skull-cap torn open by a machine and turned up like a helmet. The patient had strength enough to go to the well and pour water on the wound. A physician removed the elevated piece of skull, and sutured the soft scalp over the defect. The patient recovered.

McArdle $\frac{16}{\text{July}}$ suggests that the trephine be employed in inflammatory cranial pressure as in intra-osteal pressure elsewhere. Having examined the brain in fatal cases of tubercular meningitis, although the majority of them showed that the disease was diffuse, in several only a few small gray nodules were found, such as are present in cases of peritoneal tuberculosis, which end favorably after irrigation, and he thinks a similar result should follow if these cases received the same kind of treatment. He related an interesting illustrative case of his own. In the discussion following, Tobin expressed the opinion that tubercular meningitis might, in a considerable number of cases, be successfully treated if freely drained at an early stage.

HYDROCEPHALUS.

Phocas $\frac{118}{\text{Feb.}}$ reports two cases of trephining and drainage of the lateral ventricles for this condition. The first, a child of 11 months, with a pronounced hydrocephalus and very bad hygienic condition, was trephined three centimetres behind and above the right auditory meatus. The dura mater was incised, and a trocar was passed toward the opposite auditory canal. When it reached

the ventricle, there was an escape of cerebro-spinal fluid. A drain was passed through the trocar into the ventricle, through which the fluid continued to escape. The wound in the skin was closed, the exit of the drain being at its lower angle. The child died of meningitis five days after the operation, and it was suspected that this condition might have been due to an infection from some spots of eczema that were not rendered sufficiently antiseptic.

The second case was 25 months of age, and was blind, deaf, and idiotic. Five centimetres above the external auditory meatus a large opening, four centimetres in diameter, was made. A small opening was accidentally made in the dura mater by the perforator, from which a large quantity of cerebro-spinal fluid escaped. The skin was then sutured, a drain being employed to favor the exit of the fluid. The pulsations of the brain increased as the fluid drained away. Four months after the operation the child began to walk, but is still blind.

Audry $\frac{73}{\text{Feb. 27}}$; $\frac{15}{\text{May}}$ records a remarkable case of spontaneous healing of a spina bifida, and a subsequent ineffective attempt to cure a chronic hydrocephalus by operation. The patient, a child of 7 months, was born with an unquestionable spina bifida at the base of the lumbar vertebræ. After three weeks the tumor ulcerated, and there was a discharge of clear fluid for a month; then it became purulent, and after another week it healed up. After this had closed the head began to swell, and when the child was 7 months old the frontal circumference was twenty inches, and the left parietal bone was much more protuberant than the right. At the base of the lumbar spine the old seat of the ulceration of the spina bifida was shown by a scar; but this was not affected by crying, or pressure on the head. There was no paralysis or contracture, but the cerebral effects of the increasing hydrocephalus were becoming dangerous, and the mother was anxious that an operation should be attempted. Audry cut down through the old scar of the spina bifida and came on to a white membrane which did not seem to cover any fluid. A fine trocar was passed through it in three directions; but no fluid was met with, and the incision was sewed up. A crucial incision was then made down to the right parietal bone, about one and a half inches behind the external auditory meatus and half an inch above it; the bone was soft, and the dura mater was easily reached with a trephine. The

needle of a Dieulafoy syringe was passed through this to the depth of an inch and a half, and clear fluid was reached; a little bundle of horse-hairs was introduced and fixed there, and the fluid slowly escaped into an antiseptic dressing. The child took the breast readily immediately after the operation, but vomited its food at first, though after a few hours the vomiting ceased and a fresh meal was retained. The rectal temperature, however, went up to 105° F. (40½° C.); the dressings were saturated with a serous fluid lightly tinged with blood; and the child died within twelve hours of the operation.

Tricomi, [819 Apr.] in an infant of 4 months, drained the lateral ventricles by the same method as Phocas, evacuating through the trocar fifty cubic centimetres of clear fluid. The trocar cannula was then exchanged for a rubber tube armed with a tracheotomy tube. The rubber tube passed four centimetres into the cranial cavity, and the free end was closed by forceps to prevent too great an evacuation of the fluid. The second day fifteen centimetres of clear, white, transparent fluid were withdrawn. On the third day the fluid was found to be escaping along the side of the tube, and the temperature rose gradually to 40° C. (104° F.), when the child died. Autopsy showed hæmorrhagic spots on the internal surface of the dura, particularly over the frontal and parietal lobes. The tentorium did not completely invest the surface of the cerebellum. There was no inflammatory reaction. The longitudinal fissure was very large, owing to an accumulation of fluid there which was retained in position by a membrane coming off from the arachnoid, producing a cyst close to the lower surface of the left hemisphere. The right lateral ventricle was very large, and covered with hæmorrhagic dots. The velum interpositum was infiltrated with coagulated blood, especially at the posterior part.

MICROCEPHALUS.

According to Tuholske, [82 Nov. 28, '91] certain anatomical facts seem to be opposed to the generally-accepted ideas in regard to microcephalus. First, it is not proven that premature ossification of the sutures or fontanelles prevents the growth or development of the cranium; but it is an important factor in modifying the shape of the cranium. Synostosis of the interparietal suture will be followed by increase of growth in the sagittal diameter; the early

synostosis of the coronal and lambdoidal suture by increase in the transverse diameter of the skull; synostosis of the lateral sutures would be the cause of a saddle-shaped construction, compensated for by increased protuberance of the frontal and occipital regions, producing clinocephalus of Virchow. Secondly, the growth of the cranial bones does not take place at the sutural margins alone. If this does not admit of proof in the human skull, we may consider of value the fact that in lower animals and birds the sutures close almost immediately after birth, and the bones grow to several times their original size.

It would then appear that, since the skull grows *pari passu* with its contents, a small brain is the cause of the small skull. The *impressiones cerebri* develop contemporaneously with sutural growth; the internal plates of cranial bones of microcephalic idiots show them but scantily; much pressure has not been exerted by the brain. The cause of the arrest or retardation of the brain-growth may be an inherent fault of primordial development; perhaps the premature closure of sutures and fontanelles, modifying the shape of the skull, displacing or closing its foramina, curving its canals for the passage of arteries, may be responsible for inefficient blood-supply of the brain, and thus become the cause of retarded growth.

Estor [348 June 4; 2 July 9] reports a case in which he performed craniectomy on a microcephalic child presenting the usual symptoms. A considerable amount of bone was removed, the hole left in the skull being eleven centimetres in length by two in width. There was no appreciable improvement in the mental condition, the only benefit resulting from the operation being that the child gained the power of stooping to pick up things without falling.

Bourneville [94 Sept.] presented the results of a study of twelve skulls, taken from idiots, which showed no trace of synostosis or premature ossification, and concludes that the theory of Lannelongue in regard to craniotomy in microcephalus has no anatomical or physiological basis in fact, and that the operation should be banished from the list of justifiable surgical procedures. Binney [568 Apr.] operated upon a microcephalic child, making a longitudinal incision on the left side parallel to and about one-half inch from the sagittal suture. This incision began at the anterior margin of the hairy scalp, and was three and one-half inches in length. Anteriorly, at

an angle of about 60 degrees to the longitudinal cut, an incision one and five-eighths inches in length was made outward and backward. Posteriorly, at an angle of about 100 degrees to the longitudinal cut, still another incision was made, running outward and slightly backward for one and three-eighths inches. Along these incisions the soft parts were reflected and the bone laid bare. Beginning anteriorly, Binney sought to cut out a strip of bone by a chisel and mallet. After using the chisel for a very short time, the respiration and pulse became so bad that the child had to be inverted. Thinking that his condition was probably brought about by the concussion of the mallet and chisel, when the patient had sufficiently recovered Binney completed the operation with a Hey saw. The patient died of shock in thirteen hours.

Duran $\frac{456}{\text{Jan. 10}}$; $\frac{996}{\text{Mar. 10}}$ operated upon a child with all the symptoms of microcephalus, removing a layer of bone fourteen millimetres wide and seven millimetres long, from a point in front of the left fronto-parietal suture to the most prominent part of the parietal eminence. The following day the constant motion of the head, which before the operation had been a marked symptom, ceased, and the expression improved, the strabismus disappeared, and the motions were less inco-ordinate; but, on the eighteenth day, the child died of small-pox.

Lanphear $\frac{199}{\text{Sept.}}$ states that the fatal cases of craniotomy in his practice were due, in great part, to the fact that both sides of the head were operated on at the same time, and that too much blood was allowed to escape. The latter is now controlled by preliminary stitching, and only one side of the skull is cut at one operation; three weeks later the opposite side is done. Largeau $\frac{91}{\text{May 10}}$; $\frac{2}{\text{June 4}}$ reported the case of a child, aged $3\frac{1}{2}$ years, with ossified fontanelles, who could neither speak nor stand upright. On July 2, 1891, craniectomy was performed. The good effects of the operation were very marked during the first few days, and, although improvement was very slow for some months, it was, as regards speech and intelligence, very decided. Chénieux $\frac{91}{\text{May 10}}$ reported two cases of craniotomy. Case I. A girl, aged 4 years, in whom premature closure of the sutures and fontanelles had produced arrest of development, especially affecting the brain. There was no paralysis, but the child could not walk, and was perfectly indifferent to all around her; all her senses were blunted. A first craniotomy was followed

by distinct improvement, and a fortnight later the operation was continued along the longitudinal sinus. A few days afterward the child could stand, and the parents were highly gratified with the result. Case II. A boy, nearly 12 years old, very backward, noisy, restless, and destitute of all natural affection. In December, 1890, Lannelongue performed craniotomy along the left fronto-parietal suture. Some months later the boy seemed less restless and more attentive. A year after the first operation Chénieux carried the craniotomy along the right fronto-parietal suture. Very marked improvement followed this operation, and the result was altogether very satisfactory. Chénieux augurs well of the future of this operation, and advises that "total transverse craniotomy" should be done at one sitting.

Miller $\frac{2}{\text{July } 23}$ performed an operation on a boy 8 months old, microcephalic and exhibiting double optic neuritis. Five weeks after the operation the circumference of the head, at the same level as before, had increased to sixteen inches exactly,—that is to say, a gain of three-eighths of an inch,—but the distance between the centres of the frontal eminences had increased by nearly half an inch. A few days later still the child was able to stand, holding on by its hands to the upright bars of a nursery-fender. The vision had further improved, as evidenced by the child's following with its eyes any distinct objects moving about, and the intelligence had so increased that the little patient laughed like any other baby when played with and talked to. Two months later the vision was apparently still more acute, the intellectual activity greater, and the general health excellent.

Lane, $\frac{61}{\text{Jan. } 9}$ at this late date, lays claim to having performed the pioneer craniotomy, as far back as August 28, 1888. The patient was a child, 9 months of age. In this case the incision was made through the scalp, in the sagittal plane, from the forehead to the occiput; and the scalp next being reflected laterally, an opening was made with a small trephine in the summit of the frontal bone, on each side of the superior longitudinal sinus. Through these openings strong, blunt scissors were introduced, and each parietal bone divided antero-posteriorly. The median strip of bone, which was an inch broad and extended from the anterior to the posterior fontanelle, was easily uplifted and removed by the aid of a blunt dissector. There were next removed, on each side, sections of the

remaining parietal bones; so that the excised spaces, in totality, resembled a cross, of which the arms were of equal length and breadth. In this parietal osteotomy the underlying dura mater was separated from the bone and protected from the cutting scissors by the blunt dissector. There was but slight hæmorrhage, and the wound was closed by metallic sutures. The child lived but fourteen hours after the operation, and death was clearly due, in a great measure, to the prostrating effect of the anæsthetic, which, at the onset, induced a cyanosis, from which the child never rallied. A second craniotomy, on an imbecile microcephalic infant, in which the exsected space resembled a letter **H**, has been crowned with better results; the child lives, and gives unequivocal evidence of mental improvement.

Wyman $^{339}_{\text{June}}$ operated on a child $3\frac{1}{2}$ years old, who was born with fontanelles already closed by the complete ossification of the cranial bones. Since birth his body has grown normally, and he presented the usual appearance of a child of his age, with the exception of his head, which had increased but slightly in size. But little observation was necessary to discover that mentally he was far behind the point of development usually reached by children of his age. An incision was made about half an inch to the left of the median line of the head, extending from the frontal eminence backward to the occipital protuberance. The trephine was applied over the coronal suture. A button of bone having been removed, bone-forceps and chisel were brought into requisition, and an incision through the skull was made about one-half of an inch in width, parallel to and somewhat longer than the incision through the scalp. The membranes and brain were, as felt through the incision, unusually hard and unyielding. The wound was sutured and antiseptically dressed, and the child is making a good recovery, with already some improvement intellectually.

Morrison $^{2106}_{\text{May 25}}$ gave the results of a craniotomy on a child $3\frac{1}{2}$ years old, thirteen months after the operation. It had grown five and three-fourths inches in height. The circumference at the middle of the thighs had increased two inches. The head increased one-half an inch in the occipito-frontal circumference; one inch in the semi-circumference from one external auditory meatus to the other; a quarter of an inch in the antero-posterior diameter; a quarter of an inch in the biparietal diameter; no gain in the bi-

frontal. The improvement was decided, although by no means complete.

Prengrueber, of Paris, [14 Jan.27; 22 Apr.6] reported the case of a boy, aged 9, suffering from simple idiocy, with microcephalus, whom he had successfully treated by craniectomy. The author recognizes that, however satisfactory these immediate effects of the operation may seem to be, it will not be possible to pronounce definitely as to its results till after the lapse of many months or even years. He attributes the improvement which has already taken place to the removal of general and local compression of the brain, and a more perfect supply of blood to the compressed parts.

Wyeth, [101 Nov.,'91] in reporting a case of microcephaly upon which he had operated two weeks previously, with arrest of epileptiform convulsions, states that his operation differs from any other performed for the cure of this condition. Lannelongue, Keen, and others cut a trench about a quarter of an inch in width, and on one side, at a single operation. Wyeth thinks that if the brain is pinned in by complete ossification of the cranial bones these should be torn loose and lifted permanently, thus allowing room for full expansion of the brain. Should only temporary benefit be secured, the operation should be repeated. In the case under consideration an incision was made in the median line from near the base of the nose to just beyond the occipital protuberance. The pericranium was then pulled aside, so as to expose the skull for about one inch on either side of the median line. The cranial bones were found firmly ossified. A small trephine was applied, and with a rongeur two long trenches were made, one-quarter of an inch in width, and extending from just above the eyes to the occipital protuberance, leaving a bridge three-quarters of an inch in width to protect the superior longitudinal sinus in its entire length. At either end of these two trenches the bone was cut laterally; for that purpose the parietal bones were divided with bone-scissors for one inch and a half in the middle of the top of the head, cutting perpendicularly in the direction of either ear. Wyeth inserted four fingers beneath each half of the exposed skull-bones, and tore these loose from the dura mater, raising them freely and thus widening the trenches to one inch each. The dura was not opened; wisps of catgut were inserted for drainage on either side, from front to back, between the skull and dura, and the parts irri-

gated with a 1-to-5000 bichloride solution. The pericranium was stitched in the middle line with catgut and an aseptic dressing applied.

SURGERY OF THE SPINE.

During the past two or three years, Chipault [96 Dec.] has contributed to the French periodicals a series of articles which are worthy of careful study on the part of those who are especially interested in the surgery of the spine. [100 pp.809,969,981,'90 ; 360 pp.444,560,676,'90 ; 91 Oct.,Nov.,Dec.,'90,Nov.,'91,Aug.] He says that it is necessary to firmly fix the skin before incising it, because, at least in Pott's disease, the presence of subcutaneous serous bursæ allow it to readily slip upon the spinous processes. Hæmorrhage has no especial interest in the lumbar or dorsal regions, but is much more serious in the neck, since three times death has resulted in this region in consequence of a lesion of the vertebral artery. The periosteum should always be preserved, for, since Ollier has demonstrated on dogs that, after a subperiosteal resection of the bone a very good osseous canal is reproduced, Chipault has remarked that in five children upon whom he has operated the same result was manifest. (Upon three this was determined by palpation, but the other two were examined post-mortem.) The surgical rule should be to have a large, bony opening. Where there is a tubercular peripachymeningitis, unless there is a co-existing tubercular lesion of the pia mater, it is best not to open the dura for fear of causing a tubercular meningeal infection. Where there is an extra-dural tumor, it is equally useless, but where there is a traumatism it is always indicated.

The absence of pulsation of the dura indicates an intra-meningeal tumor, or a ring of adhesions between the membranes and the cord shutting off the circulation of the cerebro-spinal fluid. This pulsation is not present when the membranes have been the seat of a pathological compression, either from without or within ; but it returns in a few minutes after its removal if it has not been too prolonged or too intense. This return of the pulsation is a good sign. If it does not re-appear, it is because the compression has produced some intra-meningeal lesion which should be explored.

Post-mortem investigation upon the possibility of uniting the cord after complete section proved that the extent of the sclerosis

in two cases of fracture was so extensive that it was necessary to resect several centimetres, after which, owing to the lack of elasticity and the resistance of the ligaments of the pia mater, it was impossible to approach the healthy ends.

Puncture of the membranes is done by a trocar and cannula, or by an incision with a bistoury. A drainage-tube is inserted, and the cerebro-spinal fluid is allowed to drain away. Anæsthesia, which is not necessary in lumbar puncture and needs no special consideration in Treves's operation, should be, when laminectomy is performed, very profound at the moment of incising the dura mater and during the exploration of the cord and of the nerves. It is evident that, in the examination of very sensitive and delicate organs, the least movement would be disastrous. It has been proven by abundant clinical experience, so far as the dura is concerned, that such a profound anæsthesia is not essential. This membrane is by no means so sensitive as Horsley was led to believe by his first case. Anæsthesia becomes exceptionally troublesome when the lesion is high up and accompanied by respiratory difficulties, which are exaggerated by the lateral or ventral position necessary for the performance of the operation. Several deaths from chloroform and ether have already been noted among the comparatively small number of operations in this region, and consequently the greatest precautions are necessary. Auffret has suggested the use of cocaine.

More important than the nature of the anæsthesia is to reduce the effects of the shock from the operation, which is particularly marked when the manipulation of the nerve-centres has been long and painful. It is equally indispensable, after all spinal operations, to immobilize the vertebral column for a longer or shorter time, and more or less completely.

Chipault $\frac{91}{\text{No.7,'91}}$; $\frac{16}{\text{June 1}}$ has presented some new facts in connection with the surgery of Pott's caries, his first case being an example of a further adaptation of Treves's operation for lumbar abscess by direct incision and drainage. In this case—a boy, aged 9 years—no abscess could be detected, but there was severe sciatic pain in the left side, considerable lordosis from contracture of the sacro-lumbar muscles, pain on pressing over the left transverse processes of the three lower lumbar vertebræ, and also marked tenderness on palpation of their bodies through the flaccid and

emaciated abdominal wall. The diagnosis was tubercular caries of the bodies of the vertebræ with extension on the left side compressing the roots of the sciatic nerve. At the operation large fungous masses of tubercular tissue were found extending from the diseased bodies and compressing the nerves at the foramina of exit. These and the softened parts of the bodies were curetted away carefully, and in the anterior part of the cavity thus left the aorta could be felt distinctly pulsating. The operation was almost bloodless. A drain was passed across the vertebral cavity, coming out at the most dependent part of the wound. It was removed at the first dressing, and the wound was found completely healed at the second (the dates are not given). On the fifteenth day the pain and lumbar contracture had completely disappeared. In this case, to which we have referred at some length on account of its intrinsic interest, the spinal canal was not opened, but in the following cases Chipault has deliberately adopted a method for the treatment of ante-medullary lesions by trephining and drainage through the vertebral canal. In his three cases the patients were the victims of Pott's disease, and were paraplegic. The first, a boy, aged 9 years, who had suffered for some months from caries of the upper dorsal spine, suddenly became paralyzed after falling down a staircase. He was treated by suspension and jackets, but without benefit. There was incontinence of urine, but not of fæces; there was no cystitis. After a short interval the following operation was performed: An incision ten centimetres long was made over the transverse processes of the second, third, fourth, fifth, and sixth dorsal vertebræ, the periosteum was reflected outward, and the arches resected. The dura mater was found healthy, but at the fourth vertebra there was found a projection and a compression so marked that the spinal cord seemed to be altogether wanting. Numerous fungous projections into the canal were scraped away, a large abscess was opened, and the ridge of bone projecting was completely removed, and the cavities of the diseased vertebræ, as far as possible, cleaned out. The destruction of the bodies was enormous, and the removal of the disease certainly incomplete. Notwithstanding this, the wound healed, and the progress was excellent for some time, but a month after the operation the child succumbed to an attack of bronchopneumonia. At the autopsy the wound was found firmly closed

by a mass of osteo-fibrous tissue, evidently developed from the periosteum that had been preserved; but a large cold abscess in connection with other diseased vertebræ was found. In the second case, a girl aged 4½ years, the same region of the spine was affected, but not so extensively. The paraplegia was one produced by a gradually increasing pressure, and not one suddenly developed by fracture or displacement. A similar but less extensive operation was performed. Numerous outlying fungosities were scraped away, and the principal focus of infection in the posterior part of the body of the fourth dorsal vertebra was thoroughly evacuated and cleansed. A drain was inserted into it and brought out across the vertebral canal between the fourth and fifth dorsal nerves; the muscles cut were sutured, then the skin, and the whole wound irrigated until the boric solution returned clear. An immobile dressing was applied. An excellent recovery followed. On the second day motion returned in the toes, and on the fifth day she could lift the heel from the bed. In the third case, a child whose age is not given, a similar procedure gave similarly good results. In six hours after the operation the child lifted its two heels together off the bed to any height, and the paralytic club-feet had disappeared; and the following day the exaggeration of the knee reflexes was gone. So far it has continued to progress favorably.

Lane $\frac{22}{\text{Aug. 3}}$ gives the later results of laminectomy for compression paraplegia from spinal caries. In October, 1891, he had reported eleven cases of paraplegia on which he had operated. Of these, one died from the operation, and another from hæmorrhage from a rectal polypus. Both these cases would have, in all likelihood, been saved if he had made use of intra-venous injections of saline solution. Two cases were each benefited partially and temporarily by several operations, much necrosed bone being removed. Death ensued in one of these cases at a later period, from pneumonia and influenza, the paralyzed condition of the patient rendering him unfit to cope with the pulmonary complication. In none of the other cases was there any recurrence of the paralytic symptoms. In two small sinuses formed, but these were readily treated, and gave but slight inconvenience. One of the patients, whose hip was excised with excellent results after the operation on her spine, died many months afterward from influ-

enza and renal complications. It appeared almost certain that some of these cases would have succumbed to pulmonary and vesical complications if their paralytic symptoms had not been removed rapidly by operation. The very excellent results which Lane obtained in these cases, some of which appeared thoroughly hopeless, confirm him in his opinion that, in all cases of compression paraplegia due to spinal caries which do not show signs of improvement after a moderate period of recumbency, operative interference should be resorted to, and every bit of carious or necrosed bone and caseous material should be thoroughly removed and the cavity filled with iodoform, either dry or in a glycerin emulsion.

Southam $_{\text{Mar.26}}^{2}$ operated upon a child, $3\frac{1}{2}$ years of age, in whom spinal disease had been present for about a year. Laminectomy was performed, as it seemed probable that the case would soon terminate fatally unless the pressure upon the cord was removed. The spines and laminæ of the two most prominent vertebræ—the sixth and seventh cervical—having been exposed and resected, the vertebral canal was found to be filled with a quantity of soft granulation tissue; this was removed with a Volkmann spoon and scissors, the dura mater, which showed no pulsation, not being opened. The operation was at once followed by a partial return of power in the arms, but there was no improvement in the condition of the lower extremities.

A second operation was performed about three months later, as it was thought probable that there was still some pressure acting upon the cord. The spines and laminæ of the fourth and fifth cervical and first dorsal vertebræ were removed, and a quantity of granulation tissue was dissected off the cord. She has gradually and steadily improved, so that at the present time she can stand and walk without assistance, and has also gained complete control over the sphincters. The neck is left somewhat shortened, and the head is sunken on the shoulders. The operation wound is marked by a depressed linear cicatrix, beneath which the gap in the vertebræ can be felt, now filled up by a deposit of new bone.

Davies-Colley $_{\text{Mar.5}}^{2}$ reported the case of a woman with paraplegia and what was then thought to be angular curvature of the dorsal spine. The disease began seven years previously, after a fall. She

had been comparatively free from pain, etc., for some time, and had resumed her occupation. Two months before admission she had pain in the chest and back, followed by weakness and loss of sensation in the legs, with some incontinence of urine and fæces. On admission, the patient, who was fairly well nourished, had a large, rounded projection over the spines of the fourth, fifth, and sixth dorsal vertebræ. After three weeks' rest in bed, as her condition was gradually growing worse, rhachiotomy was performed, and the tumor was found to be a spindle-celled sarcoma growing from the laminæ on the right side of the spine. It was removed with some difficulty, together with the spines and laminæ of the fifth and sixth dorsal vertebræ. The spinal cord was soft, but the dura mater appeared to be healthy. Complete recovery followed, in respect of both sensation and motion, within six weeks. Davies-Colley advocated the use of the term "rhachiotomy" instead of laminectomy.

Wyeth $^{1}_{\text{May 11}}$ showed a case of Pott's disease which had been treated for two years and a half. The disease had progressed until there had been complete paraplegia, the bowels and bladder both having been involved. He had removed the laminæ of the fourth, fifth, and sixth dorsal vertebræ, opened the dura, and found the cord compressed by a lot of tubercular material, which he had removed. After two months the patient had begun to improve, and was now able to go through all ordinary movements of the lower extremities. The functions of the bladder and rectum were normal.

Auffret $^{3}_{\text{Feb.10}}$; $^{2}_{\text{Mar.5}}$ concludes that all regions of the spine are within reach of the scalpel, and they can all be dealt with surgically with the exception of the axis and atlas, which must, under all circumstances, be respected. The bodies of the third, fourth, and fifth cervical vertebræ can be reached through the mouth; if they are diseased, and particularly if retro-pharyngeal abscess exist, they should be exposed and scraped, the focus being then thoroughly cleansed with chloride of zinc. If these measures be insufficient, the trephine should be used,—of course, with all due precautions. Large doses of bromide given the day before, and cocaine locally applied at the time of operation, produce a satisfactory degree of insensibility. The bodies of the dorsal vertebræ are accessible, without serious difficulty, in the postero-

lateral region after resection of one or more ribs; care should be taken to avoid injuring the pleura or the intercostal vessels and nerves. The pleura can easily be separated from the ribs with the finger. Fractures of the spine, when the patient's life is not in danger, should be treated by sudden or continuous extension. If life is threatened, direct surgical interference is fully warranted and even imperatively indicated.

Urban [13 Aug.15] says that operation after vertebral fracture is only required when there are signs of compression of the cord. He reports two cases, the first operated upon six months after the injury. The improvement six months after the operation was such that the patient could walk with the aid of a walking-bench. The second case was done too recently to tell what the ultimate result would be. In this case there was complete paraplegia and anæsthesia in both lower extremities. Twenty-four hours after the operation there was a numb feeling in both legs. Urban advocates a temporary resection of the arch,—that is, he cuts through one side completely, but only cuts the other deep enough to enable him to bend it back out of the way. At the close of the operation it is turned back into place.

Willard [2073 Feb.,'91; 19 Jan.9] reports several spinal cases, the first a woman with a fracture of the tenth and eleventh dorsal vertebræ. Extension and counter-extension decreased the deformity, but the symptoms increased until she had paraplegia and anæsthesia in all parts supplied by the sacral plexus of nerves. Laminectomy revealed three spiculæ of bone under the eleventh dorsal vertebra pressing upon the posterior segment of the cord. They were removed. Under the first lumbar the dura was opened and a gelatinous mass was evacuated. The patient died of respiratory failure six and a half hours later, and at the autopsy a comminuted fracture of the eleventh dorsal, with several sharp spiculæ pressing upon the anterior surface of the cord and a blood-clot pressing on the posterior surface under the twelfth dorsal, were found. Disorganization of the conus medullaris was present. In the second case, a man fell from the roof of a car fifty feet through a trestle, landing upon his shoulders, and, when found, gave every indication of fracture of the spine. Laminectomy revealed a fracture of the arch of the seventh dorsal vertebra, and the laminæ of the sixth, seventh, and eighth were removed. The cord was found ruptured

under the line of fracture. Sensation was present on the next day thirteen inches lower than before the operation, but there was no improvement in motion. He died from exhaustion fifty hours after the operation. The third case was one of fracture of the third cervical vertebra in a boy who fell through an elevator-shaft. The deformity was much decreased under extension and counter-extension, and a plaster-of-Paris collar was applied. He recovered, and a year later could move his head in all directions, although motion of the chin to the right was limited. The fourth case was one of cervical spinal hæmorrhage in a boy of 18 years, who was injured by diving into a pool of water, striking on his head. No fracture was made out, but gradually symptoms of spinal compression came on. Extension and counter-extension relieved the pain and were therefore continued. In eight weeks he had thoroughly recovered, and presented no abnormal symptoms. Motion and sensation were complete. A peculiar condition regarding this case was that, after the condition of shock had passed away, there were no serious symptoms until the probable occurrence of hæmorrhage had begun to make pressure upon the spinal cord and thus to interfere with its functions. The occurrence of paralysis upon both sides instead of upon one, and the length of time after the injury, showed that the symptoms must have been largely due to gradual compression. The fifth case was one of fracture of the odontoid process of the axis, with dislocation of the atlas, following a fall upon the head, with death ninety-eight hours after injury. The last case was a fracture of the laminæ of the third, fourth, and fifth dorsal vertebræ, with dislocation of the third. The patient died.

Lloyd, $\frac{760}{\text{Dec. 26, '91}}$ in discussing these cases, referred to a case of possible dislocation of the odontoid process. The exact nature of the trouble was never ascertained, as the child recovered. She fell from bed and was picked up with the injury to the neck. She was admitted to the Philadelphia Hospital some weeks after the accident. At that time she was markedly paralyzed, and the muscles of the arms had undergone a certain amount of degeneration, indicating an injury of the cervical portion of the cord. Under prolonged rest in bed, followed by a plaster jacket and jury-mast extension, the child made an excellent recovery, although there was still some deformity in the region of the spinous process

of the third cervical vertebra and slight projection in the pharynx. There was no relapse or return of paralysis after a year on her feet.

Boiffin [3 Apr.27; 2 May 7] reported two cases in which he had trephined the vertebral column. In the first case, the urinary passages had become infected owing to repeated catheterization, and the patient succumbed to pyelonephritis two months after the operation. In a second case, a lad of 16 years, with Pott's disease of the third cervical vertebra, the four limbs were paralyzed owing to compression of the cord. Removal of the spinous processes of the third and fourth cervical vertebræ was followed by gradual improvement of the motor disturbances, and four months after the operation the patient was beginning to walk.

Ryan [53 May 23] reported the case of a man who fell with a telegraph pole which he was climbing. He was paralyzed, and was treated for thirty-six days by the recumbent position before being brought to the hospital. He had a fracture of the dorso-lumbar spine, with retention of urine and complete paraplegia, except some power in the extensors of the toes of the right foot. The bowels were constipated. Anæsthesia extended above the iliac spine. There were no bed-sores, but there was atrophy of the limbs. He was treated with iodide of potassium in large doses, and the Paquelin cautery, and extension in a plaster jacket. His recovery is so complete that at the time of the report he was thinking of taking up his trade again. Lane [6 Sept.17] reports a very similar case to that reported by Golding-Bird last year, in which an operation was performed for a fracture dislocation of the spine. The symptoms came on gradually after the injury and rapidly increased in severity. It was found that the tenth dorsal vertebra was displaced forward and slightly downward, so that the cord was compressed between the lamina of the tenth and the body of the eleventh dorsal vertebræ. The displacement was not considerable, so that the cord was apparently squeezed rather than crushed. The interspinous ligament was torn through. After great difficulty the tenth dorsal vertebra was dragged back into its normal position. This was effected partly by overextending the dorsal spine and partly by traction exerted upon the spinous process by lion forceps, and the spinous processes were tied together. Thirteen days later he appeared to have recovered complete control over his legs. The spinous

processes were in good position over the same transverse plane. The reflexes were then normal. The patient kept constantly rolling about, and complete paraplegia soon developed. The spine was then explored, when the vertebræ were found to be displaced laterally upon one another and the cord was completely divided. This unfortunate result was due to the extremely troublesome character of the patient, whom it was found impossible to control satisfactorily by any means.

Verdelet and Vénot [363 June 19] reported the case of a man who developed paraplegia following a spinal fracture, and in whom operation, undertaken *in extremis* apparently, was progressing favorably when the patient succumbed to a pyelonephritis.

Wyeth [1 Sept. 3] relates the histories of three cases of fracture of the spine in which he had operated. The first was that of a man 22 years of age. In 1890 the patient was struck by the pilot of a locomotive and fractured the second lumbar vertebra and had been immediately paralyzed from that point down. Two years later the speaker had removed the eleventh and twelfth lumbar arches, and found the cord compressed by dislocation of the body of the second lumbar vertebra; he had removed the compressing bone and closed the wound. Six hours later improvement had begun, and now the patient, though far from being perfectly well, was able to get about and had been greatly improved by the operation. Second case, 1891: Fracture in the dorsal region; operation; unimproved. Third case, 1891: Fracture of the seventh and eighth dorsal vertebræ; operation; unimproved.

Vincent [91 Feb.] reports three cases in which he trephined the spine for penetrating gunshot wound with injury to the cord. In the first case, which was one of injury to the first lumbar vertebra, removal of fragments of bone and of the bullet from the spinal canal was followed by complete recovery. In the other two cases—each of penetrating wound in the lower part of the dorsal region, with laceration of the cord and its membranes—similar treatment was followed by death, in one on the eleventh, in the other on the ninety-fourth day. With these are tabulated 30 other cases collected from various sources. Of the 33 cases, 8 were treated by surgical intervention, with 3 recoveries and 3 deaths. Of the 25 patients treated without operation, 5 recovered and 20 succumbed. Vincent comes to the following conclusions: 1. These injuries,

although very grave, are not inevitably fatal, and some of the injured subjects, there is reason to believe, may be saved by surgical intervention. 2. Whatever be the nature of the injury to the cord,—unless it be complicated by serious injury to abdominal or thoracic viscera, and provided the gunshot wound has involved the posterior or lateral parts of the spine at an accessible region,—the surgeon should open up the track of the bullet as far as the vertebral arch, and, after investigation of the nature and extent of the lesion, extract any foreign bodies likely to compress and irritate the cord. If it be found necessary to trephine the walls of the spinal canal, he should not hesitate to do so. Such treatment may be found beneficial, and, though sometimes useless, will never do any harm if practiced under strict antiseptic conditions.

In the discussion of this paper, Bazy said that in the three operations he made on the spine he used the hammer and chisel. In one case the paralysis was so extended that the patient respired by the diaphragm only. Nevertheless, chloroform was given, and the man made a good recovery. Motz reported that in a case operated upon for the removal of a fragment of the vertebral arch, on which he had made an autopsy, the bony defect was replaced by a fibrous plate. Schwartz stated that in Switzerland he had assisted a surgeon, who had already operated on six other patients, in a case in which the patient had recovered from the operation, but had not been relieved of the paraplegia. Ferrier had operated once, but without result.

Treves[6 / May 21] reports several spinal and other abscesses treated by open incision through sound skin, irrigation with a hot sublimate solution (1–5000), by means of a large stream from an irrigator raised twelve feet from the floor, many gallons of fluid being used. As soon as the fluid returns clear, the abscess-walls are scraped and irrigated until all signs of tubercular material are disposed of, the finger being used to explore in all directions and break down all septa between pockets. Sponges are then used to rub down the walls of the abscess and to dry it out, and this is continued until the sponge, after carefully rubbing all the walls of the sac, comes out perfectly dry and clean, when the incision is closed without drainage, pressure being made by properly-adjusted pads.

Schaefer[2162 / '91] also reports three cases of spinal abscess treated by incision, grattage, and drainage, with success. He advocates

the incision and drainage of all spinal abscesses, and suggests the propriety of excising the head of a rib and the transverse process in order to reach pre-vertebral abscesses in the dorsal region, instead of draining through the spinal canal, as advocated by Chipault. He has not treated any cases in this way, but has made experiments upon the cadaver, which led him to advise the operation. In one case of caries of the fourth cervical vertebra, the method of opening the abscess from behind the sterno-cleido-mastoid muscle resulted in success.

Jones [72 May] reports a case of extra-dural tumor of the spine removed by operation. The patient was a woman, aged 31 years; seven years earlier she began to suffer from rachialgia, and for three years there had been angular curvature "between the shoulder-blades." When she came under treatment there was complete muscular paralysis from the waist downward, and anæsthesia from the ninth rib, except over an area at the back of the thighs. The laminæ of the ninth, eighth, seventh, and sixth dorsal vertebræ were removed, and a tumor, loosely connected with the dura below, but more closely above, was found extending from the eighth to the fifth vertebra. It overlay the cord for one and one-half inches at its thickest part; it was about the size of an index finger. Seven months after operation her husband reported that sensation was perfect everywhere, that she walked with crutches, and that her general health was excellent. The tumor was thought to be tuberculous, but was not examined microscopically.

SPINA BIFIDA, ETC.

Bayer [88 Nos. 28-30] reports 14 operations for spina bifida, of which 5 have been reported before, but the other 9 are new cases. Out of the whole number, 3 died a few days after the operation, and are the only ones in which operative interference may be held accountable for the fatal result. Four of the other cases died after the wound had been healed for some time,—1 from a perforating ulcer over the wound, one month after it was healed; 1 from an exanthema, six months after the operation; 1, two years after, from some fever; and 1 of eclampsia, after one and one-half months. Two of these cases had hydrocephalus, and, perhaps, should not have been operated upon. Six cases are cured; 2 have paralysis, but not more than prior to the operation.

The author concludes, as a result of this study: 1. That operation in lumbo-sacral and sacral spina bifida is indicated immediately in cases where the sac ruptures at or during birth, or has a zona medullo vasculosa, and which show neither paralysis nor any other serious malformation (club-foot excepted). In those cases the nerve-filaments are to be preserved during the operation. 2. It should be undertaken as soon as the child is sufficiently nourished to withstand the shock, in cases that are paralyzed. Orthopædic appliances can be utilized to aid the paralyzed parts afterward. All portions of the cord that can be should be preserved, but portions below the sacral plexus or degenerated portions may be removed, if their removal simplifies the operation. 3. In cases that are covered by normal skin the operation should be postponed for a short time. If the sac be small, it is sufficient to dissect off the skin, empty the sac, and suture the meningeal covering. Then close the wound by suturing the fascia, muscle, and skin. In large sacs the portions free from nerve-filaments should be resected. 4. In nearly all these cases a larger fontanelle than usual is remarked; but this does not influence the operation unless there be really hydrocephalus, a moderate degree of which may not interfere with success; but if it be very severe, it would be a contra-indication.

Keen $\frac{1013}{\text{Oct.,'91}}$ reports two cases of spina bifida,—one cervical, the other sacral,—on which he operated by making an elliptical incision through the skin, dissecting it away from the walls of the tumor, and then ligating the pedicle, cutting away the mass. The skin was then united across the stump. In both cases there was some small escape of cerebro-spinal fluid. In the cervical tumor no nerve-fibres were observed, but in the sacral mass they were cut through. Both patients died from exhaustion, due to enteritis after the wounds had healed.

Park $\frac{9}{\text{May 14}}$ reports a case of non-fatal laceration of the spinal cord, due to an injury to the dorsal region by a falling beam. As it was impossible to tell whether the symptoms developed might not be due to compression, laminectomy was performed. Almost as soon as the knife passed through the skin—at least as soon as the fascia was penetrated—it was evident that the tissues were greatly lacerated, and lying upon the bone a piece of spinal cord was found. In spite of this the canal was opened, and it was

found filled with shreds of spinal cord and blood. There was still a portion of the cord intact. The patient recovered from the operation, but not from the paraplegia and anæsthesia. Park also operated upon a patient, 37 years old, presenting a well-marked kyphotic curvature of the spine, in the upper dorsal region, as the result of Pott's disease, the activity of which subsided many years ago, and which was cured. He was struck by a train and bruised about the back, and was found partially paralyzed by the ambulance surgeon, but became fully paralyzed within an hour of the accident. No signs of fracture could be made out, but hæmorrhage was suspected and trephining was undertaken. The arches of the ninth, tenth, eleventh, and twelfth dorsal vertebræ were removed, and considerable subdural clot was removed. The patient lived a week without improvement of the symptoms, during which time the wound healed. At the autopsy a fracture was found at the point of angular deformity.

SURGERY OF THE NERVES.

Harrisson, [2] v.1,p.602 recalling the excellent results that followed close apposition of the ends of divided nerves, observes that the only satisfactory way of dealing with nerves the ends of which are too far apart to admit of their being sutured is by nerve-grafting. He refers in detail to the history of eight cases in which this operation had been performed at home and abroad, and narrates a case under his own observation. A lad, aged 13 years, was admitted into the Liverpool Northern Hospital eleven weeks after a cut of the front of the right wrist had divided the median nerve and all the flexor tendons except the flexor carpi ulnaris. On admission, the fingers were immovably fixed in the flexed position, paralysis of both motion and sensation being complete in the region supplied by the median nerve. Trophic changes were also present, the hand being blue and cold, the skin glossy, and the short muscles of the thumb much atrophied. The flexor tendons were found to be matted together; nearly two inches of the median nerve had been destroyed, leaving a gap between the ends. After dealing with the tendons, the nerve-ends were freshened, thus increasing the separation to two inches, and a graft two and one-fourth inches in length, taken from the sciatic nerve of a recently-killed kitten, was

fixed in position by one fine catgut suture at each end passing through the substance of the nerve. The limb was then put in a splint, with the hand flexed and the fingers straight. The wound healed by first intention. Sensibility began to return in the palm at the end of forty-eight hours, and eventually extended to the fingers and the thumb, except to the tips of the fingers. There was also transference of sensation impressions, those from the index finger being referred to the middle finger. At the end of three months the nutrition of the hand showed great improvement. Motion did not return until the end of five months, and appeared first in the short muscles of the thumb. Now the patient could oppose the thumb to the index finger. Another operation of the same kind had still more recently been performed by Mitchell Banks, of Liverpool, upon the ulnar nerve at the elbow after excision of a neuromatous tumor, four inches being grafted from the sciatic nerve of a dog. Sensation returned within thirty-six hours. Of the 10 cases quoted by Harrisson, 3 were perfectly successful, 6 partially successful, and 1 failed. He attributed the difference in the success attending primary and secondary grafting to the trophic disturbances present when grafting was resorted to as a secondary operation. Restoration of function took place readily enough after long periods of time in respect of sensory nerves, but the degeneration which took place forthwith in the distal portion of motor nerves rendered repair slow and the return of function very gradual.

Mayo $\frac{105}{\text{Sept. 15}}$ reports the following cases: A woman, aged 30 years, had suffered from a gradually-increasing, spasmodic wryneck for five years. Section of the spinal accessory before it enters the sternomastoid was made, and there has been complete relief from the spasm since. A woman of 33 years had suffered from sciatica of right leg for twelve years, and for two years employed crutches in moving about. The sciatic nerve was stretched, using a force of twenty to twenty-five pounds; after two months' rest, she was enabled to go about without crutches. There was full motion and comparative freedom from pain. Relief has now lasted one year. A man had been injured in the left wrist twenty-five years before, the hand and wrist becoming useless from inflammation excited by the injury. For five years there was an increasing tumor and pain in this arm, supposed to be due to irritation of a nerve bound

down with adhesions in the hand and wrist. Neurectomy of the musculo-spiral and ulnar nerves was done without relief, and the forearm was amputated. A woman, aged 34 years, suffered for the past year from severe neuralgia of the left forearm and hand, limited to those parts supplied by the ulnar nerve. The nerve was stretched above the elbow, and with the return of motion the pain was again present and the neuralgia still persisted. A man, aged 45 years, suffered for three years from a severe form of neuralgia of the left inferior dental nerve. He had all the teeth on that side extracted without relief. The nerve was exposed in its canal by the chisel, and the nerve torn out at the highest point. The patient has been greatly relieved for the three years since the operation. A fleshy woman of 50 years had a neuritis of the circumflex nerve. She suffered from constant neuralgia in the arm and shoulder, with limited motion. The adhesions were broken up under ether, and after a short treatment of massage and forced motion the symptoms were relieved. A woman of 40 years suffered from neuralgia in the left supra-orbital region for several months. The supra-orbital nerve was exposed and stretched. Partial relief was obtained, which was the condition several months after, when the case passed from observation.

Page [15 Aug.] says that bulbous enlargements of nerves after amputation have become very uncommon since healing without suppuration has become the rule. The avoidance of suppuration has, in other words, prevented the formation of bulbs at the ends of the divided nerves by banishing the conditions under which they are produced. A case of amputation at the wrist-joint, on account of acute osteomyelitis of phalanges and metacarpal bones, where the incisions were deliberately made through tissues acutely inflamed and suppurating, in order that the patient might have the advantage of amputation at that site rather than higher up the arm, illustrated this fact. The parts healed as well as could have been expected in process of time, but the stump remained extremely tender, and after the lapse of some months it was necessary to open up the flaps and remove large, bulbous ends from the median and ulnar nerves. This operation was carried out under aseptic conditions, unavoidably absent from the amputation, and the man has been well since. There are certainly no bulbous ends now, and there is therefore no ground for a suspicion that this man's

nerves had any peculiar tendency to bulb-formation. A second case was not less remarkable, although on a smaller scale. It was necessary to remove a man's middle finger at the metacarpal joint, on account of acute septic inflammation beginning in a wound near the nail. The stump healed, but soon became so painful that he was unable to work. No bulbs could be felt, but pressure on the stump elicited sharp pain. It was laid open in the line of the original cicatrix, but no bulbs could be felt. Page therefore cut away from each side of the incision a lump of superfluous tissue, and in each lump thus removed was found a small, hard bulb at the end of a digital nerve. Relief was instantaneous, and the man is now well. Nerves may be cut short at an amputation, and their inclusion in the cicatrix may be carefully avoided; but if the ends are to be spared the risk of bulb-formation, healing must take place under those aseptic conditions which will certainly prevent suppuration in the wound.

Gluck, $\frac{336}{\text{Aug. 13}}$ in a case of complete radial paralysis from a punctured wound, enlarged the wound, found the ends of the nerve, and sutured them together. A month later the patient was put under treatment by electricity. Motion was returning and the prognosis was favorable.

Corsin $\frac{660}{\text{No. 2}}$; $\frac{866}{\text{June}}$ reports the case of a man, 20 years of age, who injured his hand, severing the ulnar nerve. Several days afterward he entered the hospital, and had the ends of the nerve united. A large wound was found extending from the ulnar side of the arm into the carpus. The patient was anæsthetized, and the ends of the severed nerve found and sewed together. An electric current was passed through the nerve, and thus the apposition of the ends was assured, as the muscles supplied by the nerve responded. The result was good; the sensibility returned, and finally motility began to be restored. Electricity was used, and a month and a half after the operation he could be considered cured.

Peugniez, Trepant, and Fournier $\frac{230}{\text{Dec., '91}}$ report three cases of section and suture of the median nerve. A young man received a wound of the wrist, producing loss of sensibility and motion over the portions of the hand controlled by the median nerve. This wound healed in a few days, but the sensory disturbances continued. There were also ulcers on the tips of the thumb and index finger, and sensory disturbances involving the palmar surface, first phalanx

of the thumb, the index finger, the half of the middle finger, and about one-third of the palm. An incision was made along the inner side of the palmaris longus, and the nerve was found imbedded in a mass of cicatricial tissue. There were two swellings connected by a frænum of fibrous tissue, which was carefully preserved. The cicatricial tissue was carefully removed, and the wound closed without drainage. Three days later sensibility returned to the palmar face of the thumb and index finger, but a month later the index and middle fingers were still anæsthetic, with this exception. But the absolute disappearance of the trophic disturbance was considered as indicating the prompt return of the motor power. The second patient was also wounded in the wrist, but after six weeks the wound healed. Gradually control of the index and middle fingers was lost, and he began to have ulcerations on the tips of these fingers. The cicatrix was very adherent to the flexor tendons. The sensory difficulties involved the upper phalanges of the thumb, index and middle fingers, a slight atrophy of the thenar eminence, hypertrophy of the index and middle fingers, especially the distal phalanges, and superficial suppuration of the pulp of these digits. The nails of both fingers were atrophied, and were not more than three or four millimetres long. The operation showed that the upper end of the nerve was swollen to double its size for a distance of one centimetre; the lower end was reduced in size; a fibrous tract, one centimetre long, two millimetres thick, connected these two ends. Both ends were resected until they were separated three centimetres, and the ends were then sutured. Ten days later sensibility had partially returned, and, later, sensibility and motion were normal.

The third case, a woman, was also wounded in the wrist, and fifteen days later, when she applied for treatment, there was discovered, under a cicatrix on the left wrist, on the inner side of the palmaris longus, a hard cord, painful on pressure, which caused her to cry out and which produced a tingling along the distribution of the median nerve. Flexion of the fingers was difficult, painful, and incomplete. Abduction and adduction of the thumb were limited, and extension of the fingers was also incomplete. He suffered from painful cramp and flexion of the fingers, lasting some minutes. The anæsthesia involved the end of the thumb,

the index and middle fingers, and half of the ring finger. One month after the suture the anæsthesia was limited to the ends of the fingers and thumb. Portions of the nerve which were degenerated at both extremities were resected, and the free ends were sutured. All the pain has disappeared, the movements are better, and the sensibility has improved.

Mattigron [31 June 9; 80 Aug.] reports a case wounded by broken glass, just above the wrist-joint. The median nerve was completely divided, no other injury being inflicted except the skin wound. An incision was made over the cicatrix, exposing the median nerve at the point of injury. Its upper segment was much swollen, and was attached by fibrous tissue to the skin. The lower segment was normal in size, and, on electrical stimulation, excited contractions of the hand-muscles, especially of the opponens pollicis. The cicatricial tissue intervening between the two nerve-ends was dissected away, a thin slice of the distal extremity of the proximal portion was resected, and the freshened cross-sections were brought together by direct catgut sutures. Union did not take place by primary intention. In five days there was some return of sensibility.

McBurney [1 June 18] showed a patient whose hand, eleven months before, had been thrust through a pane of glass. The ulnar nerve and artery and all the tendons on the anterior surface of the wrist were divided. Sensation on the ulnar side was completely lost. The artery was tied and the nerve and tendons were sutured. The result had not been satisfactory, on account of the adhesions of the tendons to the cicatrix. At a second operation the scar was freely dissected away from the tendons and nerve which were attached to it, all cicatricial tissue was removed, and the wound was sutured. The result was now eminently satisfactory; sensation was perfect and flexion practically normal.

De Méric [22 Apr. 20] operated on a young girl who, some weeks ago, had cut her hand deeply in the palm, on the inner side; the wound had quite healed, but the cicatrix remained a little painful, and touching it caused a peculiar, uncomfortable sensation to the patient; there was slight numbness and loss of motion in the ring and little fingers. De Méric cut down on the nerve, which he found partially divided; he passed a very fine catgut suture on each side of the partial division, and was enabled to draw it together. He

thought it strange to find no bulbous enlargement nor matting of the nerve in the cicatrix.

Stimson $\frac{1}{\text{Feb. 6}}$ reports the case of a man who ruptured the external popliteal nerve while jumping. He was operated upon six months after the injury, and a mass of cicatricial tissue was found, and imbedded in this were the ruptured ends of the nerve, separated from each other about an inch. There was considerable loss in freeing the nerve, and its ends could not be approximated, sutured, and maintained in place without flexing the knee. The leg was accordingly dressed in this attitude and kept so until some time after healing of the wound. His condition became extremely satisfactory. The only symptom of the previous trouble was inability to raise the front part of the foot actively, though the foot did not drop at all in walking. The case was interesting as demonstrating that such an injury was possible as the result of jumping, and that an operation six months after the rupture of the nerve had given complete restoration of function for all practical purposes.

Ricketts, $\frac{99}{\text{July 7}}$ in a case of gunshot injury of the great sciatic nerve, made an incision four inches long in the median line, exposing the nerve, which was three times its normal size, for a space of one and one-half inches. The nerve divided much higher than usual, so that it was necessary to divide one branch only. The internal branch was the one injured. A section, one and three-fourths inches, including the enlargement, was made, and the leg strapped in a flexed position. He was discharged on the twenty-second day, free from all pain.

THORACIC SURGERY.

By J. McFADDEN GASTON, M.D.,

ATLANTA, GA.

The aggressive spirit manifested by the operative measures of those who have been reaching out for relief in treating the disorders of the chest has been checked to some extent by the difficulties met with in some departments of original investigation. There has also been exhibited, by a few prominent surgeons, a tendency to masterly inactivity in certain fields of observation, which is claimed as conservative surgery. But a discriminating retrospect of the work done in thoracic surgery during the past year arouses the expectation of greater achievements in the future.

GUNSHOT WOUNDS.

A recent editorial states [117 Dec.] that "those who have kept abreast of the advances in the surgical resources for chest troubles, as reported in the issues of the Annual of the Universal Medical Sciences during the past three years, will fully appreciate the aggressive work in this department. But, unfortunately, there are comparatively few of the medical profession who have taken the trouble to ascertain the facts in regard to the various measures which have been adopted in wounds of the thorax, or in the modifications of the pleural contents resulting from diseases."

Notwithstanding the weight of experience in favor of hermetical sealing of penetrating wounds of the thorax, a new departure has recently been proposed by Axford, [139 Feb., Apr.] urging a free incision and removal of the blood. In the discussion of Axford's paper, G. F. Lydston stated that if a foreign body should be located and removed, such as a bullet, the removal would be attended with more damage than the bullet would if left alone. The older surgeons frequently bled from the arm to the point of syncope, in the hope that the rest secured for the circulation would permit the formation of a clot at the site of the internal injury.

This principle of rest is really the foundation upon which lung-surgery should be based. The foreign body being left to take care of itself, the remaining indications are to check hæmorrhage, to secure asepsis of the wound, and to promote rest. Many of the wounds of the lung do very well if left alone. Everything depends upon whether blood-vessels of any size have been cut across. The power of absorption by serous membranes is often forgotten. The serous sacs are practically huge lymph-sacs, and absorption from their surfaces is very active.

As Axford has suggested, it is impossible to get the pleural cavity into an aseptic condition when blood mixed with air is present in considerable quantity. His suggestion of a free incision and removal of the blood is, it seems to Lydston, logical,—not as applied to every case, but to the exceptional cases, such as that upon which he has based his paper. As the pleural cavity is already opened, he sees no objections to its free incision in suitable cases. He thinks it would be better to operate, as a primary procedure for the checking of hæmorrhage and the avoidance of sepsis, than to wait until a large accumulation of blood has occurred and septic decomposition has already taken place.

Schmidt pointed out that free incisions would convert the pleural cavity into an open pneumothorax, having external openings and, in all probability, also a communication with a bronchus; for only in case of a wound of the lung is this measure to be practiced. After the removal of the blood from the cavity, the favorable influence of the pressure of the blood previously in the cavity would be lost, and a cessation of hæmorrhage would be due to (1) retraction of the lung-tissue produced by its elasticity, producing compression of the bleeding vessel; (2) formation of a clot, due to exsanguination; (3) less mobility of the lung during respiration. These three causes would act together; and, inasmuch as the first and third are very indefinite in their hæmostatic influence, the second cause would be the one most usually effective. But stoppage of hæmorrhage by copious loss of blood is very unreliable, and is a principle never used unless more certain means cannot be brought into play in the case.

It is the conviction of Kiernan that, under antisepsis and

anæsthesia, the chief risks—shock and blood-poisoning—can be reduced.

Moyer stated that one of the problems incident to the question raised by Axford is a medico-legal one. If death result from the operation on a victim of a wound, the question, How far can this be charged to the operation? might become of serious importance. Willard is of opinion that entrance of air into the pleural cavity is far more serious, as regards lung-collapse, where the pulmonary tissues are normal than where they are diseased. He stated, and his experience was corroborated by Fenger, that incisions into tuberculous, gangrenous, or suppurating pulmonary tissue can be safely undertaken. Better results are therefore to be expected in pulmonary gangrene and abscess than from any other method of treatment. Axford said he would not think of operating in all cases; only those where there was immediate danger of large hæmorrhage, and subsequently danger from sepsis by decomposition of blood mixed with air.

It would appear, from the favorable views expressed by some of the speakers in regard to the proposition of Axford to lay open the chest in cases of considerable hæmorrhage into the pleural cavity, that this procedure met the sanction of surgeons at the present day; but, on the contrary, this practice is in opposition to the best-established principles which govern the treatment of penetrating wounds of the thorax, and an entirely different mode of dealing with this class of cases has been adopted by those surgeons having the largest experience in thoracic wounds. It is now the recognized course of treatment to allow of the escape of all the blood which may flow out of the wound when placed in a dependent position, and afterward to close the opening into the pleural cavity by suture, so as to effectually shut off the thoracic cavity from the external air. This secures the most satisfactory results.

In a paper read before the Cook County Clinical Society by Adolph Gehrmann, of Chicago, upon gunshot wounds of the thorax, the distinction of penetrating and non-penetrating is recognized. But it is stated that the anatomical extent of the injury alone can give a classification of positive utility. Without infection most cases recover, while with it most of them die, as is amply proven by the results of pre-antiseptic times. It has been said

that more bullet wounds of the chest are seen in private practice because of the number of suicides that present themselves to the private practitioner. Unless the injury is very severe, the patient presents little shock. Increasing anæmia and dyspnœa are the most marked symptoms. Sometimes clinical signs are almost absent, and the patient may have walked some distance, or may even not recognize that he is shot. As soon as the physician assumes control of the case, several important indications must be observed.

First of all the patient must be placed absolutely at rest, so that any cardiac and pulmonary excretion may be removed, and thereby hæmorrhage reduced to a minimum. Meanwhile the wound should be covered with a temporary antiseptic dressing. Even though the apparent track of the bullet does not entirely demonstrate the internal injury, yet it is of advantage to know where the bullet is. Bruising or effusion, with crepitation on one side of the external wound, would indicate an oblique entrance, while a round puncture shows that the ball has entered directly. Careful examination of the chest is very important, in that the most definite knowledge can be determined by this means. "The point is not what to do, but what not to do." In looking at primary operations from a systematic stand-point, the following conditions and indications are to be observed: (*a*) severe contusion at the wound of entrance; (*b*) for the removal of shreds of clothing, or of fragments of bone; (*c*) operations for complications, certain secondary operations for the removal of fluid in the pleural cavities, and those necessitated by infection.

All the details of surgical preparations, according to Gehrmann, $\frac{779}{\text{Sept.}}$ must be observed. Following the preparation of the part, the margins of the skin wound are to be made smooth and one or two sutures introduced. Albert says that there is but one rational means of closing wounds of the thorax, and that is by suture. Hæmorrhage is immediately stopped, and infection from the skin is avoided by the rapid union of the coaptated margins of the wound. When the absence of clothing in the tissues is reasonably assured, deep manipulations should be avoided, and it must be remembered that the probe is no longer an instrument of exploration. The extent of the injury should be determined by the anatomical relations and by physical examination of the patient rather than by probing.

Hæmorrhage and cuticular emphysema are evident, and give rise to special indications. Nothing is rational, according to Gehrmann, other than an operation for suture of the intercostal muscles and superficial tissues. In following out this procedure, it is advisable to excise the entire bullet-track down to the thorax-wall by an elliptical incision through the surrounding tissues.

The following report of a case of gunshot wound of the chest is given by J. C. McClintock, of Topeka, Kansas.[61 Apr.16] Miss K. H., a young lady of 24 years of age, was shot, on the evening of the 23d of September, 1891, at a distance of eight feet. The ball from a 38-calibre revolver had entered one-half inch to the right of the spinous process of the eighth dorsal vertebra and passed directly through the body, fracturing the sixth rib in front. The ball was located under the right mamma, through which an incision was made and its removal effected. The pleural cavity was two-thirds full of blood, and the lung and pleura had undoubtedly been perforated. There was no fever, no complication of any kind. The wound of entrance of the ball, and that from which the ball was removed, united without suppuration under occlusion dressings. An examination, March 17, 1892, showed that the patient was perfectly well, and there was no dullness over the regions formerly filled with blood.

A gunshot wound of the right lung is reported by Leonard W. Bickle, of Mt. Berken, Southern Australia.[267 Mar.15] On the 12th of July, 1891, a youth of 16 years of age was shot in the back, and a probe could easily be passed through many of the holes into the chest-cavity. The chest-walls, neck, and face were emphysematous; face and limbs cyanotic; frothy, blood-stained fluid came from the mouth, and a good deal of blood had been expectorated. The heart was well over into the left axilla. The wound was dressed with iodoform and vaselin on lint with Gamgee tissue. Ether, ammonia, and brandy were given to counteract the shock, and, later, morphia in small doses was given. His temperature next morning was 101° F. (38.3° C.), and there were indications of too severe a reaction, which yielded to the treatment, and no signs of pneumonia appeared. The emphysema gradually subsided, the heart returned to its natural place, and the pneumothorax was replaced by the expanding lung. Two or three shot and numerous fragments of the clothing were removed from time to time, and by

the middle of the first week in August he could walk about his room. Subsequently, fatigue induced a rigor, and pneumonia of the injured lung ensued, with effusions; and on the 17th of August aspiration brought away clear, serous fluid, with about 2 ounces (60 grammes) of fluid blood at the close. On the 22d, the aspiration being repeated, the upper fluid was clear, the latter part semi-purulent. Aspiration was used for the third time on the 26th, the quantity being smaller, but purulent. On the 22d of September pus was verified by trocar and about an inch of one rib was resected, when drainage-tubes were inserted. He gradually regained strength, and gained in two months over 20 pounds (9.0 kilogrammes) in weight. The cavity was never washed out, and the tube was removed in December, the patient being entirely restored to health.

Two cases of pistol-ball wounds of the chest are reported by P. A. Nightingale, of the Johare Government Hospital, in the Straits Settlements.[36 Aug.] They correspond in a remarkable manner; both being in Chinese coolies, one 28 and the other 36 years of age, and the balls, weighing 80 and 120 grains (5.19 and 7.78 grammes), respectively, having entered near the point of the right scapular angle, and being extracted in front after wounding the right lung. There was considerable emphysema in each case, and a good deal of blood was expectorated for the first two or three days. The temperature and pulse in both remained normal throughout, and simple antiseptic dressings were applied. The wounds healed rapidly, and one was discharged well on the eighteenth day and the other on the twenty-second day.

A case of penetrating wound of the pleura, of more than ordinary interest, is given by J. P. Tunis, from the service of Harte, in the Episcopal Hospital of Philadelphia.[112 Feb.] Gottlieb L., aged 54, in a fit of depression, had shot himself, with a 32-calibre pistol, directly over the heart. He was profoundly shocked on admission. Three inches above the nipple, and in the same line with that point, there was a blackened bullet wound. A probe could be readily introduced into the pleural cavity, and the air whistled in and out with each movement of the respiration. Posteriorly, under the left scapula, a hæmatoma was seen. An incision into this mass brought the bullet to the surface. It had passed directly through the pleural cavity. Two months after the

injury a sinus remained at the entrance, and small fragments of necrosed bone were discharged from it.

A rather remarkable instance is reported by J. P. Carrington, of Field's Store, Texas.[199 Sept] A young man, aged 19, was accidentally shot in the left side, about two inches below the left nipple, the charge breaking a rib, passing upward, and toward the left shoulder-blade. The wound was inflicted by a breech-loading shotgun, No. 8 shot, of which about an ordinary-sized tablespoonful entered. He was said to have lost over a quart (litre) of blood. After cleansing and removing clothing, a hole as large as a hen's egg was found, exposing the spleen and intestines. Upon careful search, the shot were discovered three or four inches back from their entrance. Next morning an opening, three inches long, diagonally across the side, was made, when about two-thirds of the shot came rolling out. The patient, eleven weeks after the injury, was doing well, but an enormous discharge of pus continued, for which an antiseptic injection was used three times a day.

An instructive case came under my own observation, in which a gunshot wound involved the left side of the chest and ranged diagonally backward into the abdomen. A report of this case was read before the Alabama State Medical Association in April, 1892.[647 June] A white man, A. C., 33 years old, was shot with a Smith & Wesson revolver of 38-calibre by another man at his left side. The ball passed through a thick coat, vest, shirt, and undershirt, penetrating the chest-wall between the sixth and seventh ribs, on a line with the anterior axillary fold, and about an inch below a transverse line from the left nipple. Nothing could be determined as to the course of the ball, there being no wound of exit. There was shock to a limited extent, with a weak and frequent pulse. No hæmoptysis appeared, and percussion revealed no dullness on the left side, while the respiratory murmur was distinct upon auscultation. It was therefore inferred that the lung had escaped injury. About twenty minutes after the injury a hypodermatic injection of morphine ($\frac{1}{4}$ grain—0.016 gramme) and atropia ($\frac{1}{150}$ grain—0.00043 gramme) was used, and repeated in half an hour, with a soothing effect. A tablespoonful of whisky, with a little water, was directed to be given every hour. Within two hours afterward blood was vomited freely, which led to the

conclusion that the stomach was wounded. Under the supposition that the contraction of its walls, after the evacuation of its contents, would close the bullet-holes, as had been observed in a gunshot wound of the bladder when the accumulated urine was discharged, it was thought proper to use remedies with a view to arrest the hæmorrhage into the peritoneum. The patient was ordered to take the following: fluid extract of ergot, ½ ounce (15 grammes); tincture of digitalis, 3 drachms (11.25 grammes); McMunn's elixir of opium, 2 drachms (7.50 grammes); and simple syrup to make 2 ounces (60 grammes), in doses of a teaspoonful at frequent intervals. Blood was vomited in less quantities several times during the night, with increased frequency of the pulse; and the depression of vital force, accompanied by sensitiveness over the epigastrium, was very marked next morning.

Conferring with a colleague of large surgical experience during the forenoon, an exploratory operation was suggested, with a view to verify the supposed perforation of the coats of the stomach and close the openings by suture if found; but he thought best to leave the case to nature, and the patient was left in his care subsequently. It was not a matter of surprise that the case terminated fatally at the end of the third day from the receipt of the injury.

An autopsy by E. Griffin, county physician, under the direction of the coroner, showed that the ball had passed through the thoracic wall, traversing the lower portion of the left pleural cavity, beneath the pericardium, thence passing through the diaphragm, and perforating the walls of the stomach with those of the transverse colon. The conical ball was found lodged in the muscular tissue on the left side of the vertebral column, nearly opposite the seventh dorsal vertebra. There was but little blood in the pleura, but much in the peritoneum.

The matter of practical moment in this case is the probable outcome of an operation soon after the wound of the stomach was indicated by the vomiting of blood. In view of the facts revealed by the autopsy, that the stomach and colon were perforated, and that no other serious wound existed, I felt warranted in testifying before the court that early laparotomy and closure of these openings, with removal of the blood from the abdominal cavity, might have averted a fatal result.

An interesting feature connected with the track of the ball is presented in the anatomical relations of the thoracic and abdominal cavities of this region, with their contained viscera.

PENETRATING LACERATED WOUNDS.

A perforating wound of the right lung, with recovery, is given by G. E. Reading, of Woodbury, N. J. $\frac{9}{\text{Feb.6}}$ R. E. G., on October 2, 1891, was gored by a vicious bull, making on the right side of the thorax a wound three inches long, the centre of which was two and a half inches below the right nipple. Through this wound air was expelled with each expiratory act, but little or none entering during inspiration. The skin and superficial fascia were torn from the ribs for some distance above and at each extremity of the external wound; in the fourth interspace, almost exactly beneath the right nipple, was an opening through which the air was escaping. When the tissues were allowed to remain over the wound, they acted as a valve, and prevented the entrance of air. A firm, thick pad was placed over the wound, after having been wrung out of a 1-to-2000 solution of mercuric chloride. Ten weeks after the injury the man was attending to his usual duties, with the wound healed up.

A perforating wound of the back and chest-wall is reported by A. J. Dodds, of Mexico, Ind. $\frac{56}{\text{Sept.}}$ W. W., aged 20, on July 14th fell from a load of hay on a pitchfork, one prong of which penetrated the back about four inches from the vertebræ. Upon auscultation and percussion, the right lung was found considerably compressed, and complete dullness extended from the seat of injury to within three inches of the sternum and to within two inches of the axilla. The patient was placed in a position favorable for drainage, and there was a discharge of blood from the wound estimated at 20 ounces (600 grammes). Perfect quiet in a favorable position for the escape of blood was enjoined, and tincture of aconite was used to combat temperature, which reached 103° F. (39.5° C.) in three hours after the injury, but terminated by lysis in forty-eight hours. There was some dullness around the seat of the injury for three or four days, but this gradually disappeared. The wound was dressed with carbolized applications, and no suppuration occurred to mar the cure.

WOUNDS INVOLVING THORAX AND ABDOMEN.

The removal of the eleventh rib, with a portion of the diaphragm, is reported by G. G. Hamilton.[187 July] A lad of 18 years noticed a growth on the right side, about the size of a walnut, which had lately grown to the size of a turkey's egg. The growth and the eleventh rib were removed, necessitating the opening of the pleural cavity. A portion of the diaphragm had to be removed, making an opening into the peritoneal cavity. The peritoneum was stitched, the gap in the diaphragm closed, and a large drainage-tube placed in the pleural cavity, the outside wound being brought together with sutures. The wound healed by first intention, and at the end of a fortnight the lung had expanded and the lad had gone to work. A case of thoraco-abdominal wound reported by me[647 June] presents points of resemblance to the results of the above operation. A negro man was stabbed in the left side; the blade of the knife entered above the tenth rib, passed inward and downward through the pleural cavity, perforated the diaphragm, and entered the abdomen.

FOREIGN BODIES IN THE AIR-PASSAGES.

In connection with a paper by J. D. Rushmore,[1 Dec.5,'91] upon foreign bodies in the bronchi, R. F. Weir, of New York, called to mind a case of the late Dr. Buck, in which the patient, after resection of the larynx, had inhaled the distal portion of a tracheotomy-tube. It was found by auscultation to be located in the left bronchus. Buck did a low tracheotomy, and was able to feel the bifurcation of the trachea with his finger, and to seize and extract the tube with a suitably-bent forceps. In a case of Weir's, while he was operating upon the lower jaw for necrosis, it had been necessary to remove a tooth. The patient struggled at the moment, and the tooth slipped from the forceps. It was thought that it had been coughed up. Forty-eight hours afterward, however, difficulty of breathing, with increased cough, etc., had come on, and an obstruction was found in the left bronchus. The man refused to have anything done, and died. The autopsy showed the tooth to be lodged at the first division of the left bronchus, from which it could probably have been extracted.

Another case was also cited by Weir, in which a patient had a tooth broken off by a dentist, and some ten days after this

accident began to have difficulty of breathing, cough, rise of temperature, and changes in the pulmonary sounds. The speaker made an opening low down in the trachea, and was able to feel the division of the bronchi. By means of a bent copper-wire loop passed into the bronchus the piece of tooth was dislodged and then extracted with an angular forceps. The speaker had recently tried on the cadaver the operation revived by Quénu, of resecting the upper left ribs posteriorly, to effect an entrance to the mediastinum, and found not only that the œsophagus was readily exposed, but that the left bronchus near its origin could be reached without invading the pleural cavity.

Tracheotomy for foreign bodies in the air-passages is treated at length by W. F. Westmoreland, of Atlanta, Ga.[117 Dec.] He states that a great variety of foreign bodies find their way into the air-passages. The symptoms exhibited by these cases vary according to the situation in which the foreign body is lodged and its nature. It may lodge in the ventricles, or, if light (as a seed), remain in the trachea and be carried up and down by the movements of respiration; or, if it is heavy (as a coin), it is very apt to drop into one of the divisions of the bronchi. The symptoms will be more aggravated if it is irregular in shape or has sharp outlines. The symptoms, for convenience, may be divided into three stages: (1) obstruction immediately following the accident; (2) irritation produced by its presence; (3) inflammation coming on at a later period. By careful dissection he reaches the trachea, and, after stopping all hæmorrhage, opens the trachea and puts in a pair of tracheal forceps to keep it open. He has never used the tracheotomy-tubes, but passes a piece of strong silk thread, six inches in length, through each side of the tracheal incision as retractors, leaving the foreign body to be spontaneously expelled.

A report of experimental bronchotomy through the chest-wall for foreign bodies impacted in the bronchi, by De Forrest Willard, of Philadelphia,[5 Dec.,'91] presents some points of much practical importance. His experiments on dogs thus far tend to prove: 1. That the collapse of the lung on opening the thorax, when the lung has not been crippled by disease, is an exceedingly serious and dangerous element, adding greatly to the previous shock, and threatening at once to overpower the patient. 2. The difficulties of reaching the bronchus, especially upon the left side,

are exceedingly great, and the risks of hæmorrhage enormous. 3. Incision into the bronchus necessarily leads, after closure of the chest wound, to increasing pneumothorax, with its subsequent dangers. 4. The delays in the operation, from the collapse of the patient, must necessarily be great. Rapid work is impossible when the root of the lung is being dragged backward and forward at least half an inch in the efforts occasioned by air-hunger, and precision is almost impossible. 5. To reach the bronchus is sometimes feasible, but to successfully extract a foreign body from it and secure recovery is as yet highly problematical, and will require many advances in technique. The anatomical surroundings are those most essential to life.

HEART AND PERICARDIUM.

A case of pericarditis treated by operation is described by Koerte. [22 Jan. 27] The patient, a little girl of 7 years, was admitted in an unconscious condition into the hospital on November 30, 1891, with symptoms of pericarditis. On December 8th the exudation reached upward as far as the first rib and below to the border of the ribs. Pulse, 160. Puncture in the fifth intercostal space. After resection of about two inches of the fifth rib the pericardium was opened, and about a litre (quart) of thin, purulent, heavy-smelling fluid was evacuated. On enlargement of the opening to the left, the cardiac movements could be plainly seen, and the heart kept on acting steadily, showing distinctly the three separate movements. It bore the washing out and disinfection well, and showed itself very tolerant of both mechanical and chemical irritations. The secretion from the pericardium was strikingly copious. The action of the heart became weaker and weaker, and on the 12th death took place from cardiac weakness.

T. Churton, of Leeds, [2 Nov. 21, '91] reports a case of hæmorrhagic pericarditis, with serous effusion in right pleura, in which he performed aspiration of pericardium thirteen times and paracentesis of pleura seven times. The patient lived over a year. The extraction of a needle from the pericardium, in a boy 15 years old, is reported by Dziembowski. [783 Feb.; 673 July] Improvement followed without any complication, and the murmur, connected with the heart's action, which could be heard about one-fourth of a metre from the chest, immediately disappeared.

A case of bullet wound near the heart-apex is reported by Green. $^{2}_{\text{Feb.20}}$ C. C., aged 18, was admitted to Westminster Hospital, December 21, 1891, with a small, circular, ragged, contused wound, three-fourths of an inch internal and slightly below the left nipple, almost over the apex-beat. The wound was caused by the accidental discharge of a single-barreled Winchester saloon-pistol at a distance of less than a yard. There was no second wound indicating the exit. The temperature was 97.2° F. (36.2° C.); the pulse was 100; the respirations, 40. There was no effusion into the pleura and no hæmoptysis. The patient complained of inability to draw breath and pain in the wound. The probe entered only a short distance, not even through the chest-wall. The patient did not sleep well, and December 22d the temperature was 99.4° F. (37.4° C.); pulse, 126; and respiration, 72. On December 23d, at 11 A.M., the temperature was 100.6° F. (38.1° C.); pulse, 120; respiration, 70. On December 24th there was some purulent discharge. The patient was discharged on January 2d, having been on full diet since December 26th.

PNEUMOTHORAX.

An interesting case of pneumothorax, of traumatic origin, is presented by J. M. Anders, of Philadelphia. $^{760}_{\text{Feb.6}}$ The injury occurred during an operation by Ernest Laplace, when, in removing the laminæ of the lower dorsal vertebræ, the pleural cavity was accidentally opened. Air entered the pleural cavity, causing the pneumothorax. The patient died two days later, and some pus was found at the base of the pleural sac.

Aspiration.—This subject is discussed by G. A. Sutherland, of London, $^{6}_{\text{June 25}}$ and W. T. Gairdner $^{6}_{\text{July 2}}$ and Leonard G. Guthrie, of Glasgow. $^{6}_{\text{July 16}}$ Sutherland states that amongst the many complications of phthisis none causes greater anxiety than pneumothorax, the mortality of which, according to Samuel West's statistics, is 66 per cent. Interference by active means is illustrated by the following case:—

H. V., aged 32 years, was seen on December 15, 1890. He had suffered from rheumatism, and when a boy had brought on a "strain of the heart" by running races. There was a family history of phthisis. On the previous night he had coughed up blood seven or eight times. The chest was well formed, and no evidence of disease of the lungs was detected on physical examination.

Two months later there was a recurrence of the hæmoptysis, with cough and profuse mucoid expectoration, which was found to contain tubercle bacilli. The only sign of pulmonary disease detected was slight crepitation near the root of the left lung posteriorly. No evidence of disease was detected in the right lung. On June 22d, after severe and prolonged coughing, he was seized with acute pain in the lower part of the left chest, passing from the front to the back, and accompanied by headache, sickness, sweating, and great prostration. The temperature was 104° F. (40° C.); pulse, 120; and respiration, 32. The decubitus was right-sided. The cardiac sounds were inaudible to the left of the sternum, but louder than normal to the right of it. Expansion was very slight on the left side of the chest and vocal fremitus was entirely absent. The expectoration was muco-purulent, blood-stained, and contained many tubercle bacilli. The treatment adopted was nourishing fluid diet, alcohol, and morphia in full doses, which soon checked the cough and retching. The decubitus became left-sided. On the eighth day of the attack he became much weaker, and at midnight his condition was critical. It was resolved to puncture the chest for relief of pressure. Air was at once heard to pass into the bottle, and by means of slow and interrupted aspiration a considerable quantity of air was removed from the pleural cavity. The patient's condition was manifestly improved. The respiration fell to 24 and the pulse to 108. On the following evening there was a recurrence of the cardiac weakness, and an area of dullness at the base of the left lung posteriorly was noted. Aspiration being again performed, at first only air was withdrawn, then air mixed with fluid, and finally 9 ounces (270 grammes) of clear fluid were evacuated, with marked improvement. At the end of a month, progress being delayed by a slow formation of fluid in the left pleura, with displacement of the heart to the right, the chest was again aspirated, and 34 ounces (102 grammes) of clear fluid were withdrawn. He then improved rapidly, and in September he was found to have gained 11½ pounds (5 kilogrammes) in weight, and could walk four miles without fatigue. He has continued in good health. Sutherland says that aspiration is not advised by the leading authorities in cases of pneumothorax. Douglas Powell spoke of the timely introduction of a fine trocar, when there are signs of increasing pressure within

the chest, but said nothing about aspirating the pleura for air. Wilson Fox referred to the treatment by a simple trocar, but believed that aspiration was best avoided. Hilton Fagge said that an aspirator should never be used. The dangers of slow aspiration in suitable cases have, perhaps, been exaggerated, and the foregoing case shows that the benefits may be very marked.

This patient's phthisical condition at the outset of pneumothorax was very serious, and was rapidly getting worse, while two months later no evidence of active phthisical mischief could be detected, nor has any since appeared. Writing on May 2d, the patient states that a large amount of fluid was withdrawn from his pleura in January, that no signs of phthisis are present, and that he is well and strong.

Commenting on this case, Guthrie comments on the following remark: "In considering the question of aspiration, one point must not be lost sight of, namely, that an attack of pneumothorax, by giving rest to the affected lung, may be a most effective therapeutic agent in phthisis." In other words, the idea seems to be, that a lung when collapsed, either from the presence of air or fluid in the pleural cavity, is in a condition of physiological rest, and is therefore better able to resist the inroad of tubercle than if it were working normally. I cannot help thinking that to regard a collapsed lung as an organ in a state of physiological rest, and to consider collapse of a lung as in any way able to check the progress of phthisis, is incorrect. How is collapse of the lung supposed to check the spread of phthisis? Hilton Fagge says that the consequent anæmia of the part has this effect, but Guthrie has never yet seen a collapsed lung anæmic; on the contrary, he has always found it extremely vascular, and congested with non-aërated blood. What is the evidence on which it is thought that pneumothorax produces a beneficial effect on the progress of phthisis? It cannot be statistical, for the death-rate of pneumothorax in phthisis is from 50 to 90 per cent. Pneumothorax is a pure accident, and by no means an indication that the tuberculous process is active at the time of its occurrence. He cordially agrees with Sutherland that the best treatment in his case was the one which he adopted, and, even at the risk of re-opening a fistula, he would do all in his power to favor re-expansion of a collapsed lung, whether the collapse be due to air, fluid, or both, in the pleural cavity.

Spontaneous Cure.—A peculiar case of traumatic pneumothorax with spontaneous disappearance is reported by W. H. Bowes, of Herne Bay. $^{2}_{\text{Apr.30}}$ G. T., aged 36 years, healthy, fell and struck the corner of a chest with his left side. Half an hour afterward a fracture of the eighth rib, near its angle, was found to be complicated with a patch of emphysema about four inches in diameter, the skin being uninjured. The chest was bandaged, and an hour later his breathing became embarrassed; he became collapsed, and fainted. An examination revealed pneumothorax on the left side, indicated by tympanitic percussion-note, diminished breath-sounds, with displacement of the heart's apex. There was no bulging of the intercostal spaces nor displacement of the abdominal viscera. Expectoration slightly stained with blood. At 7 o'clock next morning there were no traces of the emphysema or pneumothorax, and the man made a quick recovery, with no further complications. It was thought that the air might have partly returned through the wound in the air-passages.

HYDROTHORAX.

James M. Anders, of Philadelphia, $^{12}_{\text{June}}$ describes the following cases: R. C., aged 66, was well until 1875, when he was troubled with a hacking cough, with some expectoration. The following year he had three hæmorrhages, and three years ago he began to suffer with dyspnœa. When admitted, on November 28, 1891, the breathing was quite rapid and very labored. The physical examination of his chest showed slight bulging on the left side. Anders found after operation, by which 60 ounces (1800 grammes) of fluid were withdrawn, a tendency on the part of the fluid to accumulate again, at which time 70 ounces (2100 grammes) were withdrawn. A third operation was performed, the aspiration withdrawing only 8 ounces (240 grammes). Since then there has been steady improvement in the physical signs; there is now clear percussion resonance, beginning above at the clavicle down to the base of the lung anteriorly and laterally. There is still dullness over the left lung posteriorly.

Pleurisy with effusion is fully discussed by Anders, with the report of another clinical observation and treatment of a case. $^{19}_{\text{Sept.3}}$ He states that the one physical sign which is of infinitely more value than others is the change in the upper limit of dullness due

to the position of the patient. Whenever this is noted, we may be certain that the pleural cavity contains fluid. In the present case the diagnosis was confirmed by the use of the hypodermatic needle, by means of which a small amount of straw-colored fluid was withdrawn. The patient was treated by the use, internally, of the so-called iodides of this recipe:—

℞ Potassii iodidi, ... gr. v (0.32 gramme).
Syr. ferri iodidi, ... ♏x (0.61 gramme).
Syr. sarsap. comp., . . q. s. ad ℥j (3.70 grammes).
M. Sig.: ʒj (3.70 grammes), q. d.

He says that in nearly every instance in which the double iodides have been used thoracentesis has been unnecessary; but in some cases it is demanded.

PLEURITIC EFFUSION.

Medical Treatment.—John C. Thorowgood, of London, $^{2}_{\text{May 2}}$ urges active medication in the outset of these cases. Rapid absorption of the effusion followed the administration of salicylate of sodium in 17 out of 27 cases. It seems to act by reducing temperature and abating fever; and when this result is brought about, especially in cases of recent effusion, absorption proceeds at once. He believes that mercury limits inflammation in serous membranes, and so promotes absorption. He also speaks favorably of bryonia alba, as checking inflammatory pleurisy and assisting absorption of fluid. The tincture of the U. S. Pharmacopœia is used. Before tapping a patient, he considers that it is a great advantage to be able to get the temperature down, for then the chance of another collection of fluid is not great.

Jas. Alex. Lindsay, of London, $^{6}_{\text{June 9}}$ states that the only practical question is, whether by the use of drugs or operative interference we can materially hasten the natural process? Two remedies have been found useful,—counter-irritation, either by iodine or cantharides, and the administration of iodide of potassium. The addition of the ammonio-citrate of iron to the iodide of potassium seems also very advantageous. In certain cases the necessity and advantage of aspiration are universally admitted. If the amount of the effusion be very large and dullness extends as high as the second rib in front, or if there be much dyspnœa, there can be little doubt that we ought to aspirate without delay. His own

experience inclines him to the view that, apart from urgent symptoms or excessive effusion, there is no advantage in tapping during the first fortnight. Nevertheless, the good effects in suitable cases are often very striking.

Aspiration.—Herman C. Gardinier, of Albany, N. Y., $^{216}_{\text{July}}$ presents a plea for the early removal of pleuritic effusions. It has been his custom to aspirate very early in all cases of moderately large effusions, not waiting for the subsidence of fever, the efforts of nature, or the slow absorbing or eliminating power of drugs. In twenty cases under his immediate care within five years, treated in this manner, all save two have done well. In fourteen of these cases but one aspiration was requisite, perfect expansion of the lung, return of the dislocated heart, and no retraction of the chest-walls resulting. Three cases required a second aspiration, which removed very much less fluid than at first, with the same result as the above. Three cases required repeated aspirations, one of which made a good recovery. The other two, which were tubercular, were relieved by aspiration, but died subsequently from tuberculosis.

The advisability of an early removal of pleural effusions is urged by J. H. Cox, of Pilot Grove, Mo., $^{663}_{\text{Aug.}}$ who describes two cases in illustration,—one being aspirated with good effect and the other, from neglect of this procedure, terminated in pointing and spontaneous discharge through the chest-walls about the seventh interspace. There was a second pointing about a month later, higher on the chest about the fourth interspace. There was an average of 1 quart (litre) a day, for eight months, of thick, creamy pus discharged, but in one year's time this had entirely ceased. This case is an illustration of what may be accomplished by the unaided power of nature, and Cox is not prepared to say that the effusion was not purulent from the beginning of the symptoms.

Ernest Annacker, of the Manchester Royal Infirmary, $^{26}_{\text{July}}$ reports a salutary result of aspiration, which is also indorsed by Cardogan-Masterman. $^{26}_{\text{Feb.}}$ A most satisfactory result of aspiration in hydrothorax is reported by E. M. Jenkins, of Mertling, Ala., $^{120}_{\text{Aug.}}$ in the discharge of 9 pints (4½ litres) of greenish fluid, with relief to patient. H. F. Twitchell, of Freeport, $^{99}_{\text{July 21}}$ presented a case of chronic hydrothorax, treated by repeated aspirations and injection of tincture of iodine, to the Maine Medical

Association. Fifty-seven aspirations within thirty weeks yielded 661 ounces (19,830 grammes) of fluid, never being purulent. Two ounces (60 grammes) of tincture of iodine were injected in seventeen weeks. De Gassicourt [118 Feb.] reports ten cases of purulent pleurisy treated in accordance with the principles laid down by Breton, seven of whom recovered. In those cases in which pneumococci are the causative agents, cure from puncture can be hoped for, often a single puncture being sufficient. When streptococci are found together with the pneumococci the prognosis is far more serious.

A. Fahmy [235 Dec., '91] tapped a patient, aged 46, with hypodermatic syringe, in the axillary region, and got clear, straw-colored, and highly albuminous fluid. Aspiration upon Walter Bensol, of Slocum Maternity Hospital, December 16, 1891, is reported by himself, as indicating that the pleura possesses nearly, if not quite, as great sensibility as the skin itself. Cocaine injected hypodermatically relieved the pain in the skin, but there was pain when the needle passed through the pleura.

Continuous Drainage.—A unique report by B. Baskett, of London, [6 June 11] presents the treatment of a case of chronic pleurisy by continuous drainage. W. B., a middle-aged man, was admitted to hospital June 13, 1891, suffering from considerable pleuritic effusion on the left side. Aspiration was at once performed and 44 ounces (1320 grammes) of serous fluid were removed. Aspiration was repeated seven times,—the amount removed varying from 2 to 6 pints (1 to 3 litres). At this stage it was finally determined to drain the pleural cavity continuously. Accordingly, an incision was made in the fifth space in the anterior half of the axilla and a drainage-tube inserted as for empyema. Secretions continued at an enormous rate, but he was rewarded from the first by an obvious tendency to expansion on the part of the lung; the breath-sounds began at once to be heard. The fluid gradually became purulent before three weeks had passed. In about four months after the drainage-tube was inserted the discharge stopped, the wound healed, and he was completely restored to health.

Irrigation.—The different results of irrigation of the pleural cavity after paracentesis thoracis are illustrated by some of the reports of cases presented. Hugh A. Cowing, of Muncie, Ind., [56 May] gives the following observations: About February 1st the patient,

aged 20 years, noticed a prominence the size of a hen's egg, slightly reddened, situated in the sixth intercostal space, one inch outside of the left-nipple line, which afterward disappeared. On March 15th a swelling appeared at the same point as before; cough, with purulent expectoration. April 15th a small quantity of pus was discharged through an opening in this elevation, and subsequently there was an abundant discharge of pus by expectoration. On July 16th an incision was made in the ninth intercostal space, axillary line. An abundant flow of pus followed. Traumatopnœa developed, and was increased upon injecting 1 pint ($\frac{1}{2}$ litre) of 1-to-5000 bichloride solution into the cavity. On July 24th an attempt to wash out the cavity aggravated his condition, and no subsequent attempt at irrigation was made. Recovered health.

J. M. Krim presented reports of five cases illustrating the salutary results of drainage, and others used medicated irrigations in operations upon the chest with good effect. $^{224}_{\text{July 11}}$ In the discussion, Ouchterlony urged also copious washing with carbolic solutions. J. W. Irwin referred to a case in which he injected every other day from 1 pint to 1 quart ($\frac{1}{2}$ to 1 litre) of carbolized solution, of $2\frac{1}{2}$ per cent., into the cavity of the chest with advantage. Satterwhite and W. T. Dulaney, of Bristol, Tenn., spoke favorably of the measure. W. O. Roberts thought the aspirator was only of use as a means of diagnosis, and believes that an opening ought to be made just as soon as pus is discovered.

A number of articles treating of pleurisy and the consequent pleural effusions indicate the interest taken in this department of thoracic surgery. Among them are papers by J. C. Artigalas $^{1038}_{\text{Jan.8}}$; M. Alph. Guérin $^{10}_{\text{Apr.26}}$; G. Sée $^{3}_{\text{Apr 20}}$; M. Hardy. $^{3}_{\text{May 11}}$ Discussions upon the treatment of pleurisy, by Dujardin-Beaumetz, P. L. Cohen, Dieulafoy, Béchamp $^{10}_{\text{June 7}}$; Letulle $^{7}_{\text{No.10}}$; Trasbot $^{3}_{\text{June 1}}$; Dieulafoy $^{10}_{\text{Apr.12}}$; A. Pouchon $^{55}_{\text{June 18}}$; Thomas Linn, of Nice $^{451}_{\text{May}}$; E. D. Fergson, of Troy, New York. $^{40}_{\text{May}}$

PURULENT PLEURISY.

A paper of Quénu's was read by Verneuil, in which a modification of Estlander's operation was recommended. $^{22}_{\text{Apr.6}}$ Péan said that the mode of operating was not of such consequence as the proper drainage of the purulent fluid; the pleura should be largely opened. Le Fort considered the operation of Estlander far from satisfactory, for when the pleural cavity is of a great extent

and the lung retracted the result is *nil*. Formerly the aperture was hermetically sealed, and consequently the lung, freed from the weight of air, distended itself. Verneuil quite agreed with these remarks. Hardy said that the present treatment of pleuritic effusion induces the purulent changes; thoracentesis is only indicated when everything else has failed. Since 1883 Dieulafoy $\frac{22}{\text{Apr.13}}$ has practiced thoracentesis one hundred and eighty times on sixty-nine hospital patients and two hundred times in his private practice, and never once has he seen the liquid become purulent after the operation. Whenever the liquid reached 1800 grammes (60 ounces), thoracentesis was imperative.

EMPYEMA.

Empyema in Children.—A case of empyema in a female child, 7 years old, was operated upon by O. W. Braymer, of Camden, N. J. $\frac{101}{\text{June}}$ There was a marked bulging of the intercostal spaces of the left side of the chest. Aspiration was tried in the eighth intercostal space on the left side, midway between the spine and sternum, but the pus was so thick that only 10 ounces (300 grammes) could be withdrawn. On the following day a trocar and cannula (No. 12, American scale) discharged fully 1 quart (litre) of pus. A double rubber drainage-tube was introduced, but, the lumen of the tube becoming closed from pressure, a silver tube was introduced, and the cavity was washed out daily for eight weeks with a 1-to-5000 solution of bichloride of mercury, followed by sterilized water to remove any excess of the antiseptic. No attempt was made to keep air from entering the cavity, as the author could see no harm from the entrance of air in these cases. The child recovered. It is quite incomprehensible how the operator in this case introduced a double rubber drainage-tube through the opening of a trocar without any incision.

E. B. Hastings, of London, $\frac{6}{\text{Aug.20}}$ gives the condition of 24 cases of empyema in children after resection of a rib. All of these patients had a portion of one rib excised. The following figures show the periods which have elapsed since the operations: seven years in 2 cases, four to five in 4 cases, three to four in 2 cases, two to three in 7 cases, one to two in 6 cases, and less than one year in 3 cases. The ages of the patients at the time of the operations were as follow: one year in 2 cases, two years in

6 cases, three in 3 cases, four in 3 cases, five in 3 cases, six in 3 cases, seven in 1 case, eight in 1 case, nine in 2 cases, thirteen in 1 case. The completeness of the recovery in the great majority of cases surprised the reporter. The general nutrition was good in 19 cases and fair in 5. Inspection of the chest gave no indication of disease beyond the scar in most of the cases. The spine was straight in 19 cases, slightly curved in 3, and distinctly curved in 2. In 15 patients the shoulders were on the same level, in 7 the shoulder on the side of the empyema was slightly lower, and in 2 the shoulder was distinctly lower. In 16 cases there was no flattening of the chest-wall, and in 8 there was a slight degree of flattening. The gap made in the rib by the operation appeared to be closed with bone in all. There was no difference in the movements of the two sides of the chest in 14 cases; the expansion was slightly on the diseased side in 8; and there was a distinct deficiency of movement in 2. The results from percussion were as follow: complete absence of dullness was found in 8 cases; some dullness in the vicinity of the scar in 7; slight dullness over a more-extended area in 5; and distinct dullness in 4. The breath-sounds were the same on both sides in 10 cases; they were rather weaker at the site of the scar in 2; there was weakness of the breath-sounds of the affected side over a considerable area in 10, being only slight in 3 cases; they were distinctly weak on the affected side in 2. Good recovery of the lung was found in nearly all of the cases.

Double Empyema.—Two cases of bilateral empyema, under the care of Keough in the general hospital at Wolverhampton, are reported by Edw. Deansly. $\frac{6}{\text{June 11}}$ In the first case, a girl aged 10 years, pneumonia seems to have been the predisposing cause of empyema on both sides. The immediate preliminary aspiration to relieve the pressure symptoms was followed later by resection of three-fourths inch of the fifth rib in the left posterior axillary line; 30 ounces (900 grammes) of pus and lymph were evacuated, and the pleural cavity mopped out freely with cotton-wool. A tube was inserted and antiseptic dressing applied. Eleven days after the operation on the left side the right empyema was opened and drained by free resection of the eighth rib in the scapular line. When seen four months afterward, the patient was well and strong. The second case, in a child of 18

months, gave the ordinary signs of pleural effusion in the left side. Half an inch of the left eighth rib in the scapular line was resected, and a large quantity of thin pus evacuated. Death occurred thirteen days afterward, and the right pleural cavity was found full of thin pus.

Complications.—A paper on empyema and bronchiectasis was read by James [36 Apr.] before the Medico-Chirurgical Society of Edinburgh. Black claimed that, as diaphragmatic empyema had a tendency to evacuate itself upward into the lung, it was desirable to know if any surgical procedure was recommended for the evacuation of pus externally, so as to prevent this tendency. Ritchie found bronchiectasis to be a very rare disease, and that, by careful percussion and auscultation, even small collections of pus could be located without resorting to frequent exploratory punctures. Norman Walker remarked that the repeated use of the same needle for several exploratory punctures was not to be considered a satisfactory asepticism, and pleaded for the more free use of the dry-heat sterilizer before making exploratory punctures.

The external discharge of pus through the wall of the chest is of doubtful propriety in cases of a free opening into the bronchi giving an outlet for the pus.

Rudolph [2 May 28] relates the following exceptional case of empyema in a young man aged 18 years. On February 16, 1891, signs of fluid were found at the left base of the chest, and pus was withdrawn by the exploring needle. Incision, with removal of a piece of the seventh rib, was practiced, and a litre (quart) of pus evacuated. On March 2d exploration in the second left interspace revealed pus. The chest was again incised and a piece of the third rib removed; 2000 cubic centimetres (4⅕ pints) of pus were let out. There was no communication between the upper and lower empyemas. A sequestrum of bone was removed from the lower wound on June 27th, and the patient was discharged well on September 9th. It is the practice at the Magdeburg Hospital, Rudolph says, to resect a rib and to wash out the pleural cavity in all cases of empyema. It will be noted by the reader that, in this respect, the records of the present year contain a greater number of cases in which medicated irrigation was used than formerly.

Empyema of Encysted Form.—An interesting case of encysted and suppurating pleurisy, with consecutive caries of the eighth

rib, in which resection was attended with entire relief, is reported by Don Manuel Panizo y Muñoz. 634 Aug.15 Cowell 22 Jan.1 reports the case of a man, about 30 years old, who had suffered from pneumonia, and some pus was drawn off by aspiration. As the cavity filled again, he excised about two and a half inches of rib, cut into the abscess-cavity, evacuated the pus, washed it out thoroughly with an antiseptic solution, and left in a drainage-tube. John M. L. Davis, of Dunedin Hospital, 557 July operated for empyema in an infant under 5 months, being the youngest on record. He first aspirated through the sixth space in the mid-axillary line and drew off some pus, and afterward made an incision in the seventh interspace in the posterior axillary line and put in a drainage-tube, with good result.

Resection of Rib and Drainage.—Brümische reports two cases successfully treated by costotomy and lavage of the pleural cavity. 673 Mar. In one of the cases a section of the tenth rib was removed from the angular portion, but the finger penetrated through this opening, between the liver and the diaphragm. After closing this opening, a portion of the ninth rib was removed, a quantity of pus evacuated, and the pleural cavity washed out. The patients recovered in both cases, and the wounds healed in about two months.

A most unique account of a complication of empyema with perforation of the œsophagus is given by S. F. Johnson, of Los Angeles. 44 Sept. The patient died, and an opening was found in the œsophagus, opposite the third dorsal vertebra, about an inch long and three or four lines in breadth. A paper entitled "Empyema Treated by Excision of a Rib" was presented by C. W. McIntyre to the Minnesota Academy of Medicine, January 12, 1892, and elicited an instructive discussion by O'Brien, Bell, Andrews, Green, Fliesburg, and Dunsmoor. 105 Sept.1 The views of the several speakers covered all the various processes which have been adopted in the treatment of pleuritic effusion,—from simple aspiration, through the intermediate steps, to resection of a number of ribs.

Estlander's Process.—H. Threlkeld-Edwards 787 July reports a case of empyema successfully treated by Estlander's operation, in which the pleural cavity was thoroughly washed out daily with solutions of boracic acid or creolin, and occasionally a douche of hydrogen peroxide. Tobias Nunez 179 v.26,p.259,'91 reports a case of traumatic pyothorax, in a man 21 years of age, in which he performed Est-

lander's operation. As has happened before in several cases, the drainage-tube slipped into the pleural cavity, but it was extracted with forceps without further inconvenience. G. W. Lasher, of Los Angeles, $\frac{44}{\text{Dec.,'91}}$ in speaking of empyema, says one case was aspirated seventy-three times before resorting to pleurotomy, which resulted in cure. Another case was cured after aspiration had been repeated eleven times. His practice is, after third aspiration, to

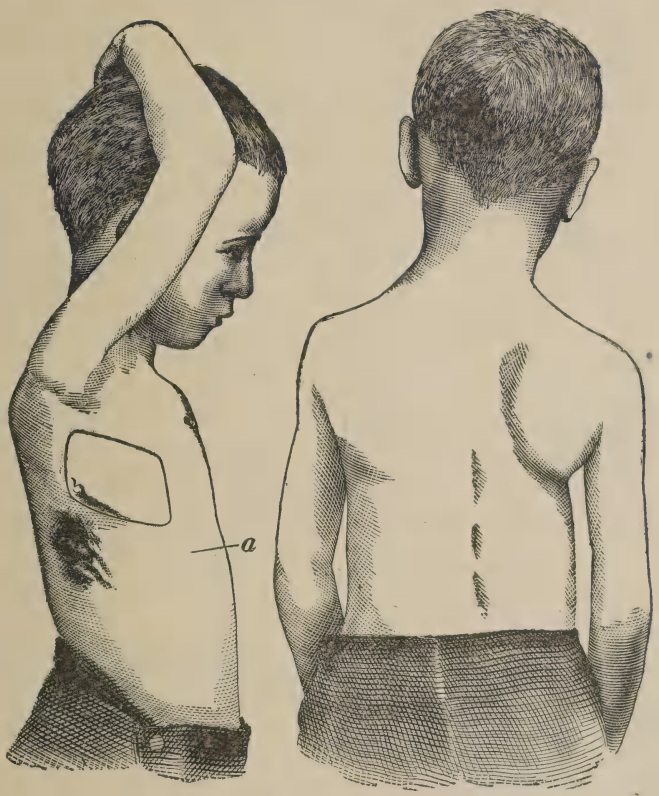


FIG. 1. FIG. 2.

EMPYEMA.

(*New York Medical Journal.*)

perform pleurotomy in seventh interspace, and, if rib be diseased, resect.

An instructive paper upon the indications for thoracentesis, for thoracotomy, and for thoracoplasty, with the results which can be obtained by these operations, is presented by Alvaro Esquerdo. $\frac{456}{\text{Feb.}}$ When there is empyema, he thinks aspiration may succeed, if the collection of pus is moderate and laudable in char-

acter, by washing out the cavity with a weak solution of salicylic acid. In the greater number of cases the resection of an inch from the middle third of the sixth or seventh rib is the better plan. This gives space for emptying the cavity and washing it out, but he cautions against allowing the pus to escape too rapidly, lest the patient die from syncope. Boéchat [197 May 20] relates the history of a girl who was suffering from empyema, for which a portion of the sixth and seventh ribs were excised and a drainage-tube inserted. This dropped into the cavity, and, upon enlarging the opening, was detected with the finger and removed with forceps after the lapse of two years.

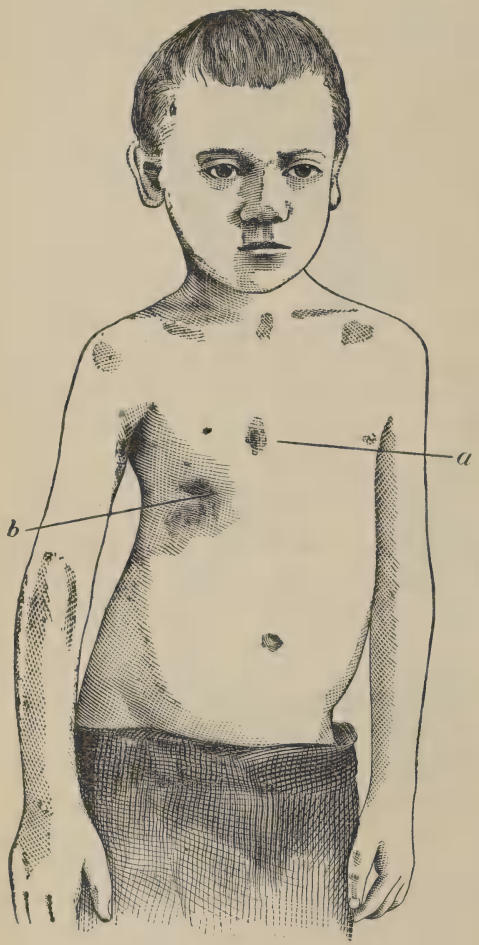


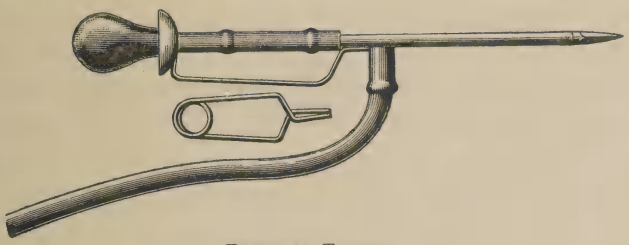
FIG. 3.—EMPYEMA.
(*New York Medical Journal.*)

Fourteen operations for empyema, with only one fatal result, are reported by C. T. Poore. [1 Sept. 2] The diagnosis has always been made with the hypodermatic syringe. The rule has been to operate as soon as a diagnosis has been made. It has been found that after the removal of pus temperature has fallen and appetite improved. The opening has been made in the post-axillary, between the seventh and eighth or between the eighth and ninth ribs. In only two cases has the cavity been washed out. In old cases a segment of two ribs has been excised, in order to afford ample room for the drainage-tube. In two cases Estlander's operation was performed. The first died from amyloid degeneration, the second recovered. In this case of Est-

lander's operation the chest is much flattened and depressed on the diseased side, and the shoulder on that side drops some (Fig. 2); in front (Fig. 1) the chest-walls are flattened. Compared with Case 14 (Fig. 3) the result is better, both as to use of lung and amount of deformity.

Other papers of practical importance are those of P. A. Boéchat, of Paris [197 July 20]; Hanquet [454 Jan.]; Dujardin-Beaumetz [67 Nov.30,'91]; Pierre Mertin [212 Sept.10]; Sagnet [7 No.18]; J. N. Nelms, Taylorville, Ill. [222 Aug.]

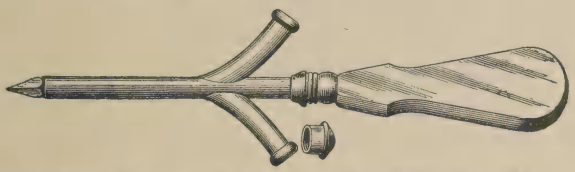
New Instruments for Pleural Evacuations.—A pleural trocar



PLEURAL TROCAR.
(*Buffalo Medical and Surgical Journal.*)

is described by Marcell Hartwig, of Buffalo, N. Y., of which a cut is here given. [170 Mar.]

A pump is not needed. About four feet of rubber tubing will siphon the pleural cavity perfectly. Oil the stylet with antiseptic vaselin, and compress the rubber interstice gently with two fingers while withdrawing the stylet. At a time when the diag-



TROCAR FOR AUTOMATIC WASHING OF THE PLEURAL CAVITY.
(*Journal American Medical Association.*)

nosis of pleural exudation becomes possible, there is probably always pressure enough in the pleural cavity to expel the air from the siphoning tube. The tube should, however, be filled with an antiseptic fluid when the trocar is plunged into the intercostal space, while the end of the tube dips into the same fluid in a vessel on the floor.[2103]

A trocar for automatic washing of the pleural cavity in case of empyema has been devised by G. Krieger, of the University of Würzburg. [61 Apr.2]

A T-formed cannula, the central tube of which bears a trocar, is armed with two rubber tubes, each containing a valve, so that an injected fluid may be allowed to pass only in one direction. If the so-filled trocar is introduced into the pleura, the intra-pleural pressure will suffice to expel the pus, which will flow through the lower tube. When, by the next inspiration, a negative pressure acts upon the cavity, an aspiration of any antiseptic fluid through the other tube will take place and fill the pleura until the next expiration commences. A washing of the pleura is thus secured without any manipulation.

The various processes of operating for empyema, in quite a large number of cases, indicate not so great a diversity of views among those who have had large experience as might appear to the reader. Yet the growing conviction seems to be adverse to Estlander's operation, except in extreme cases. The excision of a small portion of a single rib to facilitate drainage and washing out of the pleural cavity is the process which has been most frequently used with satisfactory results. It is evident, from the numerous reports of cases in which medicated irrigation has been resorted to during the past year, that it is growing in favor with the profession in different parts of the world. The operation of Tuffier, included in the records of this department for the past year, has been often referred to by authors of late, yet has not been repeated. The same may be said in regard to the process of Quénu to effect an opening into the posterior mediastinum, also noted in the last issue of the ANNUAL.

ABSCESS AND GANGRENE OF LUNG.

Perier, of Paris, $\frac{6}{\text{Apr.}2}$ reports the case of a man, aged 58 years, treated surgically for gangrene of the lung. An incision being made in the left second intercostal space, the lung-tissue covered by pleura was seized with a pair of forceps. The pleura and the lung were then successively incised, about two centimetres of lung having to be traversed before the purulent cavity, which had a capacity of 60 cubic centimetres (2 fluidounces), was reached. The cavity was carefully disinfected, its parietes washed with camphorated naphthol, and finally two large drainage-tubes secured in it by suturing on each side. The operation was performed on December 25, 1891, and union was complete on February 9,

1892, one drainage-tube having been removed on January 10th and the other on January 14th. All cough, expectoration, and morbid physical signs having disappeared, the patient, who is feeling quite well, may fairly be pronounced cured. Symes Thompson advocates this operation.

Francisco Sanchez Pizjuan, of Seville, Spain, [634 Mar.31] reports two cases of pulmonary trouble in which solution of corrosive sublimate was employed, with good effect, after puncture.

Abscess of Other Viscera Discharged by the Lung.—A case of traumatic abscess of the liver and perinephritic space discharging through the lung and urinary tract is reported by J. M. Bryan, of Fountain Springs, Pa. [19 Aug.27] E. C., aged 38, miner, was struck on the back by a fall of coal. He kept at work for two weeks, when a swelling appeared in the right renal region, and he was compelled to stop work. At the expiration of a month, C. came to the State Hospital. On admission to the hospital, the patient had the appearance of a dying man, with anxious expression, and his body drawn to one side. In the right renal region was a rounded swelling, firm on pressure, in which fluctuation could not be detected. He had a severe cough, attended with copious expectoration, consisting of almost pure, creamy pus and a little coal-dust. About the same time his urine became "milky," as he expressed it, and he felt much relieved for a few days. Microscopic examination of the urine also showed pus, with no tube-casts. On June 10th a small tenotome was passed deep into the lumbar muscles over the swelling, with a negative result. An incision was then made, and the surgeon's finger was forced through the muscular covering into the abscess-cavity, from which about 30 ounces (900 grammes) of thick, ropy pus exuded. Digital exploration showed the under surface of the right lobe of the liver excoriated as far as the finger could reach. The whole cavity was thoroughly irrigated with 1-to-4000 warm bichloride solution and the peroxide of hydrogen, a drainage-tube inserted, and the wound dressed antiseptically. The hectic symptoms ceased; the discharge slowly lessened, when the tube was removed, the temperature not reaching 100° F. (37.8° C.).

The patient has never since had an untoward symptom. He has gained greatly in strength and weight, the urine is free from pus, and the cough nearly gone, with returning general health.

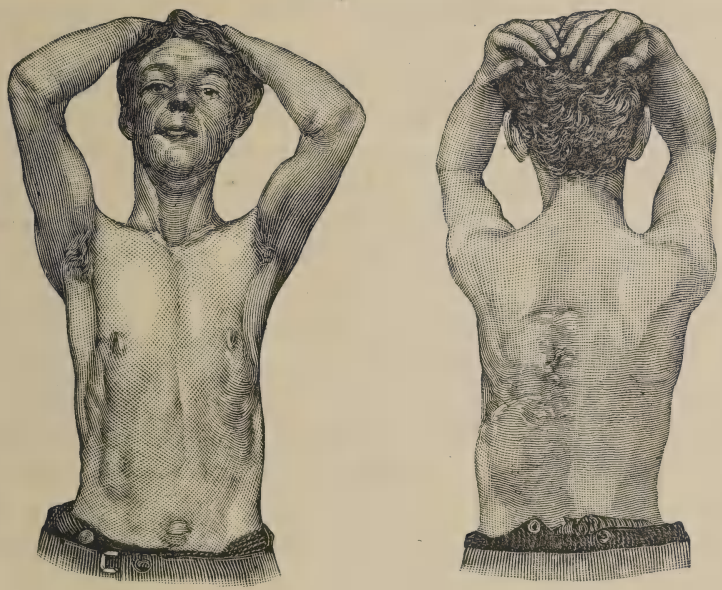
A. K. Steele, of Chicago, $^{647}_{\text{June}}$ had under his care, in the Cook County Hospital, a patient (male, aged 30 years) who had spent some years in the tropics, who was admitted to a medical ward suffering from a severe cough, expectorations of large quantities of thick, greenish-yellow, purulent sputum, occasionally tinged with blood. There was great emotion, hectic temperature, and the physical evidences of an empyema discharging through a bronchus. At the post-mortem examination an abscess of large size was found in the right lobe of the liver that had ulcerated through the diaphragm into the right pleural cavity and then into the right lung, opening and discharging through a large bronchial tube. It was an interesting case, as the liver-abscess origin of the empyema had not been suspected.

A recent case under my own observation illustrates forcibly the readiness with which hepatic abscess makes its way through the diaphragm into the lung. Having examined the patient and found a marked intercostal bulging, with tenderness along the upper margin of the liver, which was diagnosed as hepatic abscess, an operation was deferred until next morning, when it was verified that it had broken into the lung, with a free discharge of pus with the expectoration.

Resection of Lung.—Delagenière, of Mans, $^{3}_{\text{Apr.30}}$ reports a case of resection of lung for pulmonary gangrene, with a favorable result. From this case and nineteen other recorded cases of pneumotomy for pulmonary gangrene, Delagenière draws the following conclusions: The operation has hitherto failed to give the desired results, because surgeons have been content merely to drain the gangrenous focus, instead of extirpating it as completely as possible. The pleura should be opened very freely at the side by an **L**-shaped or **U**-shaped incision, or behind by a vertical one, according to circumstances. The operator should not hesitate to resect sound ribs, if necessary. This class of cases should not be confounded with uncomplicated empyema, in which many operators have dispensed with the resection of ribs.

Suture of Lung.—An interesting case of suture of the lung is described by Guermonprez. $^{22}_{\text{Aug.17}}$ A young man, aged 18 years, entered the hospital for pleurisy, which rapidly became a pyopneumothorax, and for which the pleura was opened largely. It was necessary, finally, to perform Estlander's operation, on account of

a persistent broncho-pleural fistula. Portions of six ribs were removed, and thus it became easy to find the inferior orifice of the fistula. The two lips were drawn together by means of a catgut suture, and immediately the air ceased to pass. Convalescence was tedious, but in the end the man was able to resume work, without other incident than a small, circumscribed, phlegmonous abscess, resulting from the detachment of a little fragment of bone from the surface of a rib. The figures represent the condition of the subject of this operation on May 30, 1892.



SUTURE OF THE LUNG.
(*Journal des Sciences Médicales de Lille.*)

An experimental study in pneumonectomy and lung-suture by W. Lemoyne Wills, of Los Angeles, Cal., [147 May] leads him to the following conclusions:—

1. Do not suture skin wound except for purposes of pressure, as it heals too rapidly for deeper tissues and retains discharges, and seems to provoke formation of, or at least to retain, cheesy matter. 2. Close external wound with interrupted sutures, as skin and muscles are so loose that they pucker and do not heal rapidly. 3. Suture deep muscles layer by layer very carefully, so as not to leave spaces, and to superficial muscles, but not to skin. 4. Leave no more stump

of lung than necessary, and the smallest pedicle which will be safe. 5. Without any constitutional evidences of sepsis (the greatest care and cleanliness being used), it seems that rabbits have a tendency to the formation of a cheesy pus in the healing of all wounds.

[This cheesy material was found to consist of pus, broken-down granulation tissue, young cells, bacteria, but not tubercle bacilli, when examined by Geo. Lasher and Lula T. Ellis.]

Experiments in pneumotomy and pneumonectomy with suturing of lung, by De Forrest Willard, of Philadelphia,[112 Feb.] gave the following results:—

1. In thoracotomy and in bronchotomy the entrance of air into the pleural cavity is a far more serious matter, as regards the collapse of the lung and of the patient, when the lung-tissue is normal than when it is diseased or already crippled. 2. Incision into the substance of the lung, with removal of a portion, is well borne by dogs. Hæmorrhage, though free, is not fatal, and can be arrested by packing. 3. Adhesion of the parietal and visceral layers can be readily obtained by sutures, and the resulting pleurisy is slight. 4. Surgically, these experiments point out that similar adhesive inflammation can be secured, and thus permit safe incisions into tubercular or other diseased lung-tissue, without infection of the pleural cavity. 5. A lung can be drawn into the wound and sutured outside of the pleural cavity. 6. Pulmonectomy for gangrene or abscess of the lung offers better results than is possible in cases not treated surgically.

INTRA-THORACIC TUMORS.

Diagnosis.—Julius Schwalbe[69 No.45,'91] states that non-malignant tumors of the lung—as osteoma, lipoma, etc.—are extremely rare, so are those of the pleura (myxoma, fibroma, etc.). Carcinoma, sarcoma, and endothelioma are the primary malignant tumors occurring in the lungs. Of carcinoma, according to Rokitansky, three forms may be distinguished microscopically: (1) tumors of the size of a bean to that of a hen's egg, either soft or hard, of a medullary character; (2) very large tumors, overgrowing the lung like fungi; (3) a medullary diffuse infiltration, presenting, microscopically, almost the appearance of a pneumonic hepatization. Clinically, he divides the tumors into diffuse and circumscribed.

The latter, surrounded by lung-tissue, remain often undiagnosed; the former will generally show physical signs of consolidation.

A paper by Fraenkel is based on his observations upon nine cases of thoracic tumors coming under his care at the Urban Hospital, in Berlin. $^{90}_{\text{Feb.}}$

Virchow $^{61}_{\text{Feb.20}}$ states that a helpful discrimination may be made at the outset by inquiring whether the tumor is of the class which tends to ulceration, or to those that do not readily ulcerate.

Mediastinal and Pulmonary Carcinoma.—Percy Kidd described a case of mediastinal and pulmonary carcinoma, which shows the character of these growths in a very satisfactory manner. $^{2}_{\text{Mar.19}}$ The patient, a butcher aged 52, suffered from cough, expectoration, dyspnœa, and wasting for three months. There was retraction of the left side of the chest in front, with dullness over the whole lung, most marked at the upper lobe. Death occurred from exhaustion eight weeks after admission. The necropsy disclosed a large carcinomatous growth in the forks of the trachea, extending into and infiltrating the upper lobe of the left lung, which was firmly adherent to the ribs; the lower lobe was partially collapsed, and the bronchi were dilated and filled with pus. There was no growth in the right lung, which was larger and contrasted strongly with the left. The left main bronchus was moderately narrowed from infiltration of its mucous lining.

Tumors of the Mediastinum.—A civil engineer, 56 years old, presented symptoms which led Nathan Jacobson $^{9}_{\text{Aug.27}}$ to believe that his patient suffered from a mediastinal tumor. Inspection of the chest showed a prominence of the inner extremities of the second and third ribs of the left side and the sternum at this level. The area was exceedingly tender, and the patient could not bear to be percussed at all. At the most prominent portion of the sternal projection a small tumor could be seen and felt. Numerous secondary glandular growths appeared under the skin, some of them quite large, and many even more painful to touch than the sternal growth. Two years after coming under treatment he grew gradually more feeble until death occurred. The autopsy, in the presence of Didama and Sears, showed that the tumor had so thoroughly infiltrated and become a part of the thoracic organs that their removal could only be done *en masse;* it proved to be a small round-celled sarcoma.

The case of a colored woman, presenting very similar features, was treated by me at the clinic of the Southern Medical College, in Atlanta, a year ago. The diagnosis of mediastinal tumor was submitted; and, regarding this class of growths as originating in glandular degeneration, the patient was given, for internal use, continuously, 10 drops of Donovan's solution, with 1 drachm (4 grammes) of compound tincture of gentian, in a tablespoonful of water, three times a day. Externally, over the enlarged and sensitive areas of the upper part of the sternum and sternal attachment of the ribs, there was applied a combination of equal parts of the ointments of mercury, iodine, belladonna, and camphor.

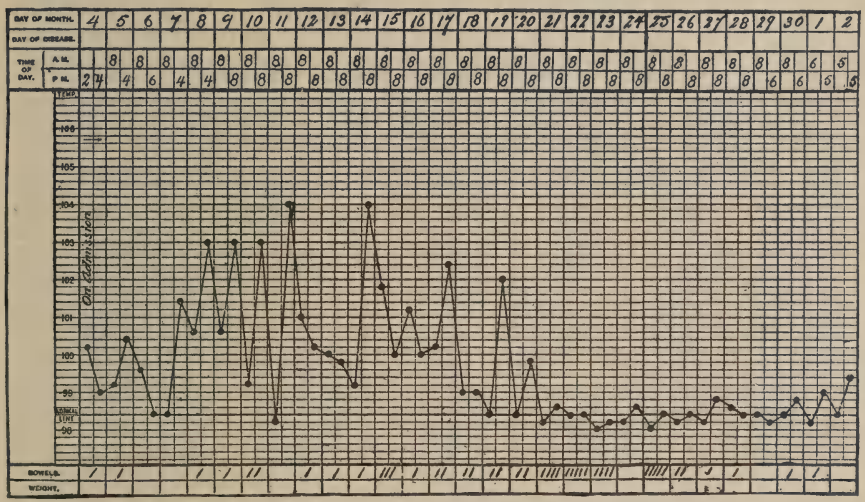
Time after time, when seen, this medication was renewed, and continued for three months, with decided improvement. Upon being presented at the clinic during the present session, the relief was so complete that a continuance was ordered.

A clinical lecture by William Pepper, of Philadelphia, [451 Feb.] treats of a case of abscess of posterior mediastinum, with cyanosis and subcutaneous emphysema; venesection; recovery by discharge through the lung.

M. G., aged 28 years, engaged in driving heavy carts, and his work had required much heavy lifting. November 5, 1891, he began to complain of tightness about the chest and located the constriction at the supra-sternal notch. A remarkable feature was a high degree of subcutaneous emphysema, which extended over the neck and the upper part of the chest. The symptoms pointed to intra-thoracic pressure. On November 7th the high fevers and other alarming symptoms led to bleeding from the arm to the extent of 20 ounces (600 grammes), with a good effect. The fever, as shown by the accompanying temperature chart, assumed a markedly hectic or septic type, and there were physical signs of infiltration of the lower lobe of the left lung. A fine cannula was introduced, but no liquid was obtained. By November 20th free expectoration of purulent matter began, with closing up of the lung. January 5th the patient was doing well and convalescent.

Hydatids of the Lung.—An interesting case of hydatid of the upper part of the left lung, with operation and recovery, is reported by Cleghorn, of Blenheim. [557 Oct.,'91] Mrs. D., aged 34 years, admitted to the Wairam Hospital, June 6, 1891. There was dullness on left side and absence of respiratory murmur over an area

from one finger's breadth below clavicle to the level of the fourth rib. The second rib was decidedly bowed forward. A hypodermatic needle inserted between the second and third ribs on the left side could be felt to be in a cavity, and hydatid fluid was withdrawn. June 7th an incision was made along second rib. The periosteum was stripped off, and two inches of the rib was removed by the bone-forceps. A thin layer of lung-substance was stitched in four places to the costal pleura. The lung was incised by a narrow bistoury, and the opening enlarged by a pair of sinus-forceps. The finger removed a thick-walled mother-cyst and two daughter-cysts. A drainage-tube was introduced and the skin



TEMPERATURE CHART IN ABSCESS OF POSTERIOR MEDIASTINUM.
(*International Medical Magazine.*)

sewn up. June 13th, tube removed. Patient left the hospital July 11th. On August 28th she had gained flesh and seemed perfectly well.

Another case was reported by Cleghorn, $\frac{557}{July}$ in which recovery also followed operation.

A case of suppurating hydatid in the left lung is reported by W. H. Ord and H. B. Robinson, of London. $\frac{2}{Jan.30}$ J. S., aged 18 years, admitted to St. Thomas's Hospital on October 25, 1890. He had a cough for five weeks; in the meantime a pain occurred in the right side, and he brought up half a pailful of an opaque, yellowish-white fluid. There was dullness over the lower fourth

of the right lung behind; impaired resonance as high as the fourth rib in front. Robinson made an incision from the angle of the seventh rib to the inferior angle of the scapula; the periosteum was detached and one and a half inches resected. On cutting into the lung, about a pint ($\frac{1}{2}$ litre) of stinking pus escaped from the wound, followed by a very large collapsed hydatid cyst. Two drainage-tubes were introduced. On the following day the cavity was washed out with 3 pints ($1\frac{1}{2}$ litres) of weak Condy's fluid, which was repeated on the two following days. He died thirteen days after the operation. Post-mortem showed a large smooth-walled cavity, occupying most of the lower lobe of the right lung, and two hydatid cysts in the liver.

Netter $\frac{3}{\text{Aug.}3}$ presented the case of a child which had a hydatid cyst at the apex of the left lung that communicated with the bronchi. This cyst was treated successfully by pneumotomy. Percussion indicated the axillary region as the part where the cyst approached nearest to the thoracic wall. This was the point selected for puncture and for incision, and a resection of the third rib was made. Bouilly incised the pleura and the pulmonary tissue, which were adherent, and found the hydatid sac at a depth of two and a half centimetres. The result of this operation proved so good that the lung has regained its functions completely.

The report of 208 cases of cysts in which there was no operation gives 113 deaths, 71 cures, and 24 in which the result is unknown, making, with the exclusion of the last, 38.58 per cent. of cures. The results are better in cysts opening into the bronchi, being, in 133 cases, 31 deaths, 80 cures, and 22 unknown, giving 72 per cent. of cures of this nature. But in the cases which have undergone pneumotomy the results are much better; 38 cases of this kind have given 32 successful operations, making 87.21 per cent. of cures. At the Congress of Australian Physicians in 1889 statistics of 17 cases operated on furnished 16 radical cures, giving 94.11 per cent. of cures.

Monod referred to an analogous case, in which he had had a like good result. His patient suffered from pulmonary gangrene, limited to the posterior part of the lung.

It seems to be demonstrated, beyond a doubt, that interference in all cases of abscess of the lungs which have not opened into the bronchi is attended with a favorable result, and the reports

now presented of the outcome of operations for hydatid cysts should serve as encouragement to practice thoracotomy and pneumotomy whenever the diagnosis can be made out satisfactorily.

TOPOGRAPHY OF THE FISSURES OF THE LUNG.

Eugene Rochard, of Paris, $\frac{100}{\text{Feb.23; Mar.1,5,8,12}}$ gives the result of his personal examination of twelve dead subjects, which will doubtless

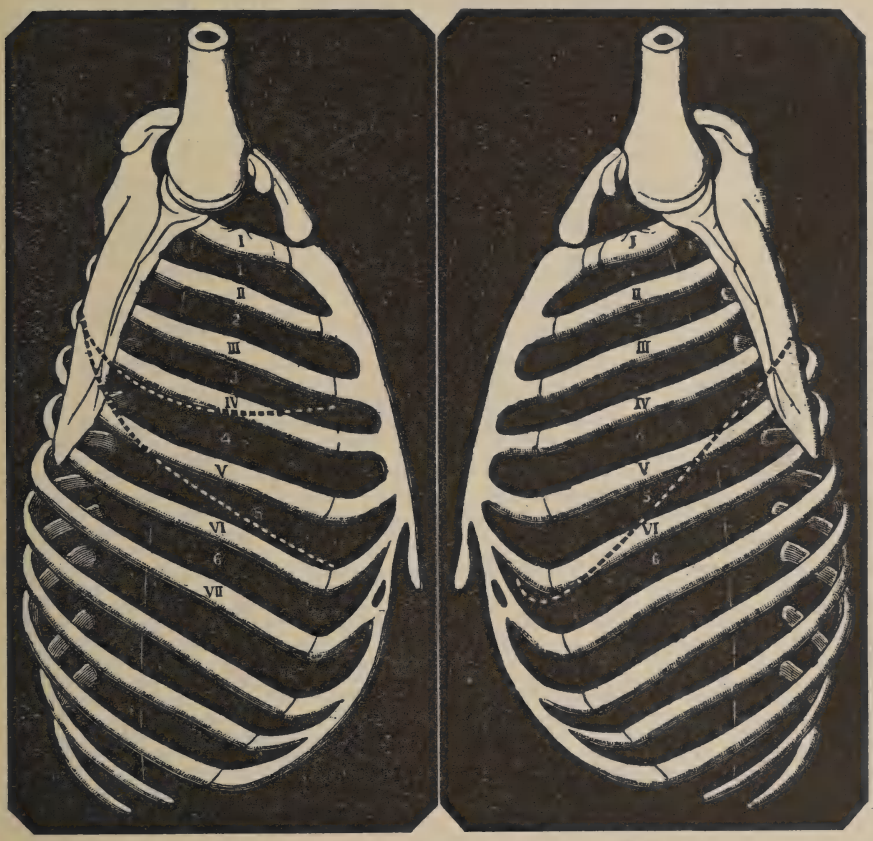


FIG. 1. FIG. 2.

TOPOGRAPHY OF THE LUNGS.
(Gazette des Hôpitaux.)

be of service in the surgical treatment of abscess of the lung and interlobular pleurisies by transcostal opening. Five subjects examined are represented by figures, which will explain themselves, and are herewith given.

The case in Figs. 1 and 2 was a woman, 29 years old, who

died some hours after a traumatism. The thoracic cavity and lungs were sound. Her stature was 1.53 metres; the thoracic circumference was 83 centimetres.

Right Side.—Some adhesions to the wall; no interlobar adhesions. The figures represent the most usual type. The oblique or inferior fissure commences in front in the fifth intercostal space, on the superior border of the sixth rib, ten centimetres from the median line. It crosses the fifth space, the fifth rib on a level with the axillary line, and terminates in the fourth space on a level with the posterior part of the internal border of the fourth rib.

The horizontal or superior fissure begins in the third intercostal space, near the chondro-sternal cartilage. It goes horizontally back, traversing obliquely the inner surface of the fourth rib, and joins the oblique fissure, in the fourth space, behind the axillary line.

Left Side.—No adhesions. The left fissure commences in front in the sixth intercostal space, on the inferior border of the cartilage. It crosses obliquely the inner surface of the sixth rib, the fifth intercostal space, cuts obliquely the inner surface of the fifth rib on a level with the axillary line; then, reaching the posterior part of the thorax, terminates behind in the farthest part of the intercostal space.

The case shown by Figs. 3 and 4 was a man, 50 years old, who died from a cerebral affection. His stature was 1.68 metres; the thoracic circumference, 86 centimetres.

Right Side.—Total adhesion of the visceral, costal, and diaphragmatic pleuræ. Adhesion of the interlobular fissure. The great oblique or inferior fissure commences in front in the fifth intercostal space, on the superior border of the sixth rib, and reaches to the inferior border of the fifth rib, on a level with the axillary line, goes back to upper border of sixth rib, and ends on the posterior part of the inner surface of this same side. Its course is therefore more horizontal than usually.

The horizontal or superior fissure commences in front in the third intercostal space, on the upper border of the fourth rib, and four centimetres from the median line. It goes horizontally behind, crosses the inner surface of the fourth rib, the fourth intercostal space, where it is in communication directly with the axil-

lary line, the inner surface of the fifth rib, and terminates in the posterior part of the fifth space, without connecting with the great oblique fissure, of which it remains independent.

Left Side.—Total adhesion of the pleuræ. The left fissure commences in front at the inner surface of the seventh rib, seventeen centimetres from the median line. It crosses obliquely the superior

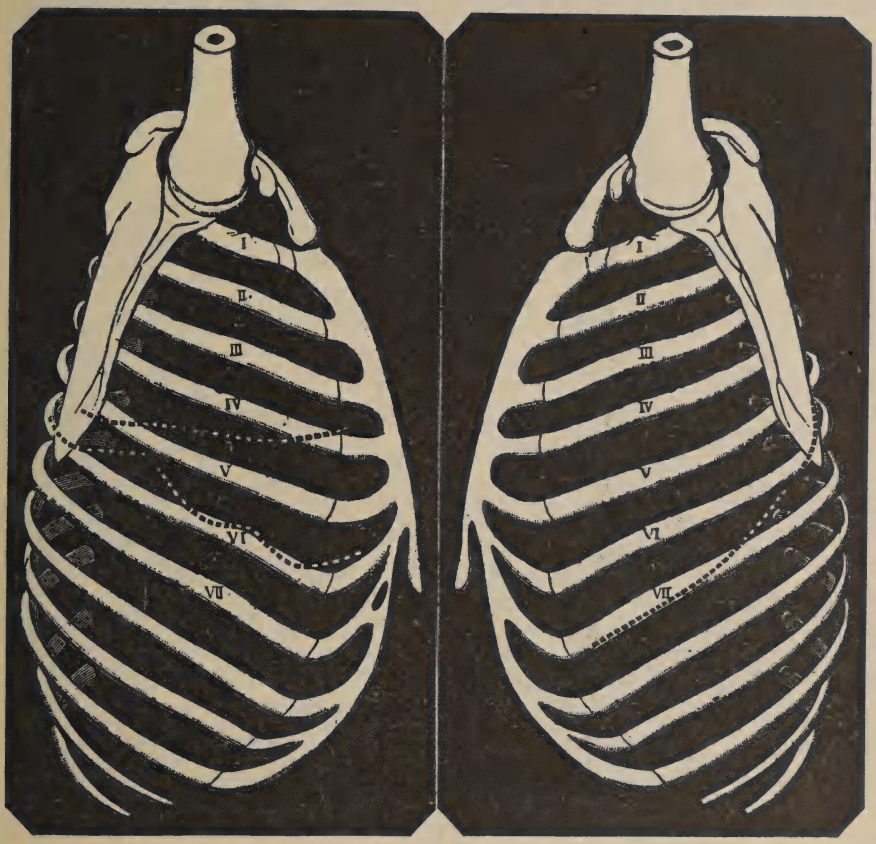


FIG. 3. FIG. 4.

TOPOGRAPHY OF THE LUNGS.
(*Gazette des Hôpitaux.*)

part of the inner surface of the seventh rib, to arrive in the sixth space behind the axillary line, and terminates in the fifth space on the superior border of the sixth rib, eleven centimetres from the line of the spinous processes. It does not separate entirely the two lobes, which remain united behind by a point of pulmonary parenchyma five centimetres long.

The case exhibited in Figs. 5 and 6 was a man 56 years of age. His stature was 1.59 metres; the thoracic circumference, 72 centimetres.

Right Side.—A small adhesion on the apex of the lung. Some slight adhesions, easy to detach, in the horizontal fissure. Nothing

FIG. 5. FIG. 6.

TOPOGRAPHY OF THE LUNGS.
(*Gazette des Hôpitaux.*)

in the great oblique or inferior fissure, which commences in front in the fifth space, on the superior border of the chondro-costal articulation of the sixth rib, eight centimetres from the median line. It traverses almost perpendicularly the fifth intercostal space, the inner surface of the fifth rib, the fourth intercostal space, and the internal surface of the fourth rib. It cuts the axillary line in the third space, where its direction becomes less oblique, traverses

the inner surface of the third rib, and ends on a level with the posterior part of the inner surface of the second rib.

The horizontal or superior fissure commences in front opposite the articulation of the cartilage of the third rib with sternum. It descends immediately in the third space, which it follows,

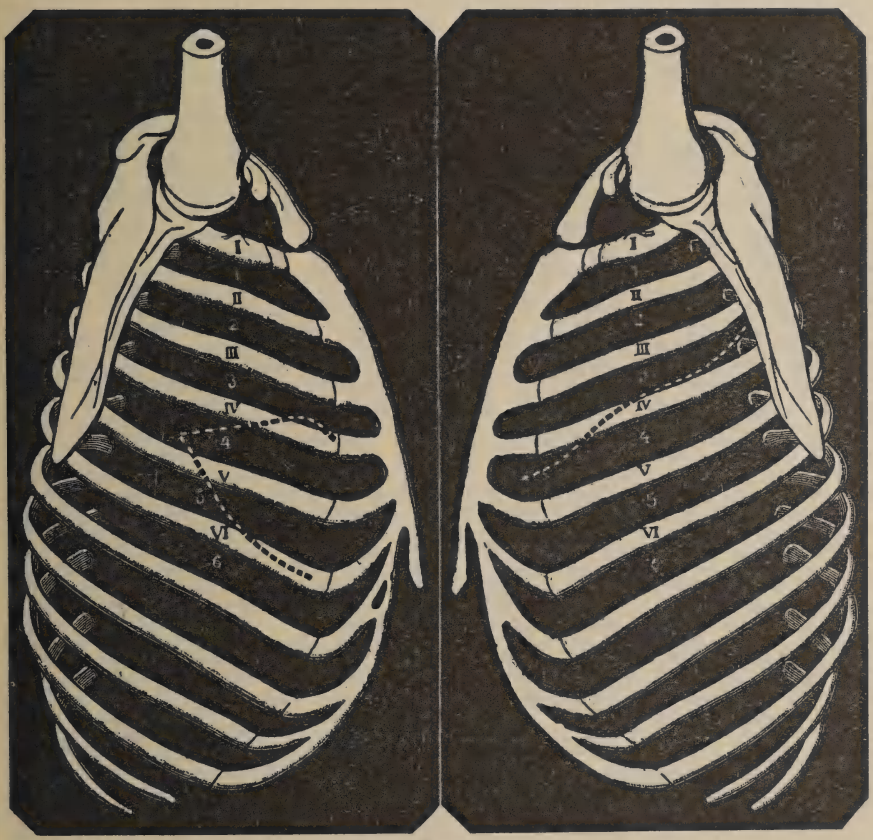


FIG. 7. FIG. 8.

TOPOGRAPHY OF THE LUNGS.
(*Gazette des Hôpitaux.*)

describing curves, and ends in the oblique fissure, on a level with the axillary line.

Left Side.—Adhesions of the diaphragmatic pleura. Very solid adhesions between the two lobes.

The left fissure begins in front in the fifth space, eleven centimetres from the median line. It passes obliquely behind the fifth rib, reaches the fourth intercostal space, traverses the inner surface

of the fourth rib, behind the axillary line, and, after having crossed the third space, ends on a level with the posterior part of the inner surface of the third rib.

The case shown in Figs. 7 and 8 was a man 69 years old. Large traumatism was the cause of death. Stature, 1.65 metres; thoracic circumference, 85 centimetres.

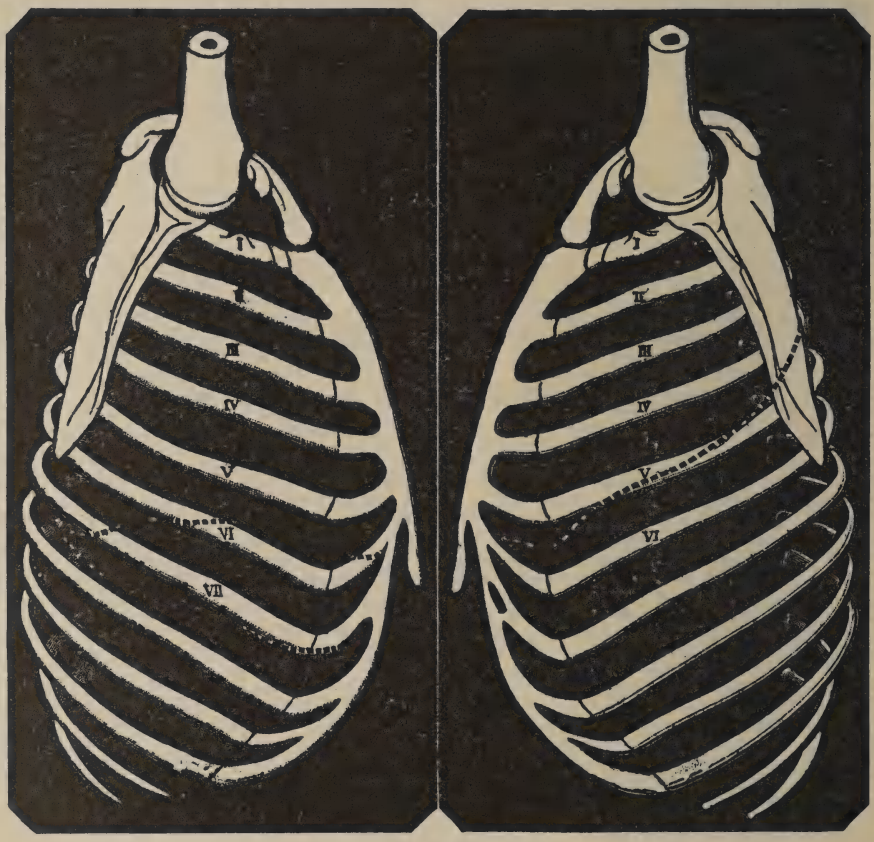


FIG. 9. FIG. 10.

TOPOGRAPHY OF THE LUNGS.
(*Gazette des Hôpitaux.*)

Right Side.—Some slight adhesions at the apex.

Left Side.—Small but complete adhesions of the parietal and visceral pleuræ. Interlobar adhesions. The lines will show the fissures.

Case shown in Figs. 9 and 10 was a man 47 years old. Stature, 1.66 metres; thoracic circumference, 75 centimetres.

Right Side.—Some slight interlobar adhesions.

Left Side.—Slight adhesions of the two pleuræ.

All cases are shown in Figs. 11, 12, and 13 by the twelve lines described below.

The results Rochard reaches are as follow:—

Right Side.—The great, or oblique, fissure commences, nine times out of twelve, in the fifth intercostal space or on the inner surface of the sixth rib, most often nine or ten centimetres from

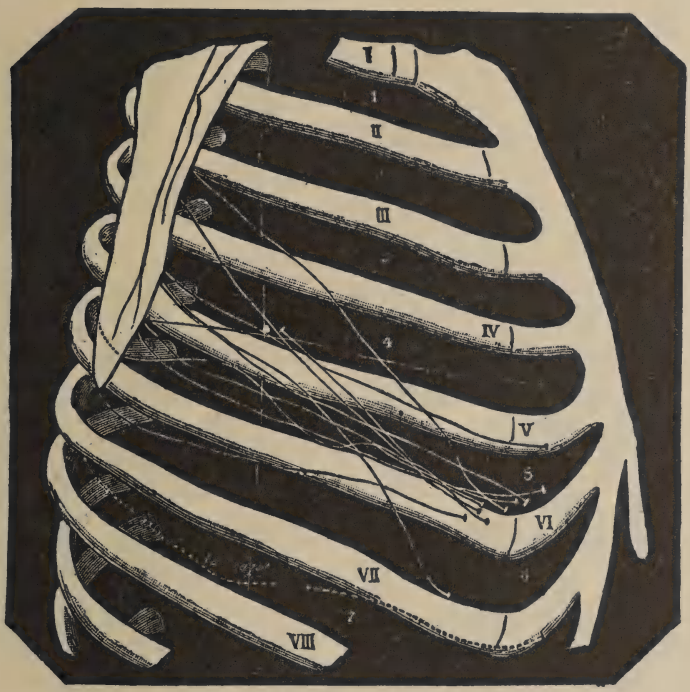


FIG. 11.—SURGERY OF THE LUNGS.
(*Gazette des Hôpitaux.*)

the median line. It had its origin once in the fourth space, once in the sixth, and once in the seventh. It runs upward and backward, describing a convexity upon the lateral surface of the lung, and on a level with the infra-axillary line; it was contiguous five times out of twelve with the internal surface of the fifth rib, twice with the fifth space, twice with the fourth. It might be said that, nine cases out of twelve, it is contiguous with the fifth rib or the intercostal spaces which border upon it, on a level with the axillary line.

Following its course upward and backward, it terminated on the inner surface of the fifth rib three times in twelve; in the fourth intercostal space, three times in twelve; in the fifth intercostal space, twice; being eight times in the region of the fifth rib. Once it terminated at the internal surface of the second rib; another time, very low at the inner surface of the seventh rib. In one subject it stopped in the neighborhood of the axillary line.

As may be seen, the most usual course of the great oblique

FIG. 12.—SURGERY OF THE LUNGS.
(*Gazette des Hôpitaux.*)

fissure differs from that given by the authors. It commences higher in the fifth space instead of the sixth, and especially terminates much lower.

The *small horizontal fissure* commences, seven times out of twelve, in the third intercostal space; once at the internal surface of the third rib; once on the internal surface of the fourth rib; being nine times in the same region. Its origin once was in the fourth space; once at the inner surface of the sixth rib. In one subject it was absent. It goes horizontally backward, stopping

irregularly, but always communicating, except in one case, with the great oblique fissure behind the axillary line. In two subjects it continued its course, independent and complete, to the posterior border of the lung; in another, it was scarcely marked. Three times it communicated with the great oblique fissure on a level with the fourth space, once opposite the inner surface of the fourth rib, once on a level with the third space, and in the other cases on a level with the fifth, sixth, and seventh spaces.

FIG. 13.—SURGERY OF THE LUNGS.
(*Gazette des Hôpitaux.*)

As may be seen also, the course of this fissure is very irregular. It arises, in a rather constant way, on a level with the third intercostal space. Its origin is therefore higher than stated by German authors, who place it in the fourth intercostal space. It will be seen by Fig. 12 that the fourth rib should be resected to explore the horizontal fissure.

Left Side.—The only fissure situated on this side—the *great left oblique* fissure—commences, five times out of twelve (Fig. 13), in the fifth intercostal space; four times in the sixth space; once

at the inner surface of the fifth rib; being ten times out of twelve in the region of the sixth rib. It was found once in the fourth intercostal space and once opposite the internal surface of the seventh rib. Its point of origin would be, therefore, lower than that of the great right oblique fissure. It arises in an interval comprised between six and seventeen centimetres from the median

FIG. 14.—SURGERY OF THE LUNGS.
(*Gazette des Hôpitaux.*)

line; but oftener this point of departure is confined to a space between six and eleven centimetres. Thence it is directed upward and backward, describing a convexity upon the lateral surface of the lung, on a level with the *infra-axillary line.* It is contiguous four times out of twelve with the internal surface of the fifth rib, three times with the internal surface of the fourth rib, three times with the fifth intercostal space, and twice with the sixth intercostal space.

It extends, therefore, upon the antero-posterior part of the thorax, most often along the fifth rib, then along the fourth, and finally the sixth.

Following its course upward, the great left oblique fissure terminates three times on the inner surface of the fourth rib, twice in the fourth intercostal space, twice on the inner surface of the

FIG. 15.—SURGERY OF THE LUNGS.
(*Gazette des Hôpitaux.*)

third rib, once in the third intercostal space, and twice in the fifth intercostal space. In one of the subjects it terminated eleven centimetres from the line of the spinous processes, and did not, consequently, divide the lung posteriorly.

The termination of the great left oblique fissure is, then, generally (eight out of eleven cadavers) situated higher than the end of the right one. It does not always reach the vertebral

extremity of the third rib, the site assigned by Luschka and the German anatomists as its termination. The great left oblique fissure commences in front, lower than the great right oblique; it ends behind, higher.

Determination of the Average Tract of the Interlobar Fissures in the Skeleton.—This is readily ascertained to occupy a zone containing the fifth and sixth ribs, which are the ones, therefore, to be taken out by the surgeon, as shown in Figs. 14 and 15. The fifth intercostal space in front and on the side is the one most commonly in communication with the oblique fissure. Fig. 11 shows this on the right side; Fig. 13 shows the same to be the case on the left side.

SURGERY OF THE ABDOMEN.

By JOHN H. PACKARD, A.M., M.D.,
ASSISTED BY
JOSEPH P. TUNIS, M.D.,
PHILADELPHIA.

ŒSOPHAGUS.

Œsophagotomy.—Robert Abbe, of New York, [1 Mar.19] reported the removal of a tooth-plate which had been lodged in the lower portion of the œsophagus for more than a year. The patient was a man of 35 years, presenting every appearance of being in the third stage of phthisis. Under anæsthesia an incision three inches long was made, as low as possible, on the left side, at the insertion of the sterno-mastoid muscle. A large, easily-bent, block-tin bougie was inserted through the mouth, in order to make the œsophagus prominent. The plate could be felt an inch and a quarter below the supra-sternal notch, and was extracted with the assistance of large, curved dressing-forceps. On the fifteenth day the patient was discharged with the wound healed. Lennox Browne, of London, [22 July 18] extracted a dental plate three and a half years after it had been swallowed. The patient made an excellent recovery. George W. Gay [99 Apr.7] reports three cases of œsophagotomy which he performed within the last year; twice for a foreign body and once for stricture of the gullet, which could not be overcome by bougies alone. Two of the patients recovered and one died. The first case was 3½ years old. The second case was 28 years old, and finally succumbed to septicæmia and exhaustion. The third case was a man, 48 years old, who experienced only temporary relief from dilatation. He lived two months after the operation, in comparative comfort. Richardson [99 Jan.21] details the case of a

TOOTH-PLATE IN ŒSOPHAGUS.
(*New York Medical Journal.*)

boy, 3 years of age, in whom obliteration of the œsophagus throughout the greater part of its course existed. External œsophagotomy was performed and dilatation attempted; death resulted.

F. T. Paul, of Liverpool, [187 Jan.] has removed three foreign bodies from the alimentary canal: (1) a gold tooth-plate from a man of 33, (2) a shawl-pin swallowed by a girl of 10 (by œsophagotomy), and (3) a sovereign eleven years in the rectum. All three patients made a rapid recovery after operation. R. H. Rozeweig, of Malmesburg, Cape of Good Hope, [2 Dec.5,'91] reports the case of a man who had swallowed a gold tooth-plate measuring two and one-quarter inches in its longest diameter, and one and one-quarter in its shortest. Seven weeks later it was passed per anum, with considerable pain and free hæmorrhage.

NASAL GUIDE AND STOMACH-TUBE IN POSITION FOR INTRODUCTION.
(*Journal of American Med. Association.*)

L. Alexandroff, [586 '91; 152 June 9] of Moscow, among forty-four thousand children treated at St. Olga's Hospital, has seen only seven cases where foreign bodies were lodged in the œsophagus. A child of 2 years swallowed an overcoat-button, which could not be dislodged. The button was finally extracted through an incision along the internal border of the sterno-mastoid muscle. There was very little hæmorrhage.

L. H. Prince, of Batavia, Illinois, [61 Dec.5,'91] to introduce the stomach-tube quickly and easily through the nasal cavity into the pharynx, uses a nasal guide. After thoroughly anointing the guide and tube, the point of the guide is inserted into the tube through the fenestra at its side and passed along until it pro-

jects a little beyond the extremity. They are then passed together into the nostril, the tube lying above the instrument, the handle of which is, at first, depressed. The tube is managed with one hand, the guide with the other. As the back of the nasal cavity is reached the handle of the guide is raised and the tube can then be easily passed down into the œsophagus, the guide being withdrawn as the tube passes over the soft palate.

STOMACH.

Gastrostomy.—N. Senn, of Chicago, $\frac{1052}{Jan.}$ states that Sédillot was the first to perform gastrostomy (November 13, 1849), although the operation was performed on animals by Bassow, of Russia, in 1842, and by Blondlot, of France, in 1843, for the purpose of studying the physiology of digestion. Senn concludes, also, $\frac{22}{Aug.10}$ that: 1. Gastrostomy is indicated in all cases of cicatricial and malignant stenosis of the œsophagus and cardiac orifice of the stomach, as soon as a sufficient quantity of food cannot be introduced into the stomach by simpler measures *per viam naturalem.* 2. Gastrostomy for malignant obstruction on the proximal side of the stomach, if performed at a time when the patient is sufficiently strong to survive the immediate effects of the operation, is a comparatively safe procedure, and adds from a few weeks to six or eight months to the patient's life. 3. In the treatment of impermeable cicatricial stenosis of the œsophagus gastrostomy not only furnishes a new inlet for the introduction of food into the stomach, and thus prevents death from starvation, but it often proves a curative measure in such cases, as the gastric fistula can be utilized for another purpose,—successful retrograde dilatation of the stricture. 4. The upper central part of the left rectus and the eighth intercostal space between the cartilages of the ribs are the most desirable points for the formation of the gastric fistula. 5. If the patient's strength warrants it, the operation should be done *à deux temps*, as it is safer to postpone opening of the stomach until firm adhesions have been formed between the stomach and the circumference of the external incision than to establish the gastric fistula at once. 6. Fixation of the projecting cone of the anterior wall of the stomach in the abdominal wound is best secured by two long needles passed through the serous and muscular coats only, and suturing of the surface to the circum-

ference of the wound. 7. Leakage from the fistula can be prevented most effectually by making the opening in the stomach small, by the use of an inflatable double rubber bulb through which the feeding-tube reaches the stomach, or by making an oblique tunnel in the anterior wall of the stomach as devised and practiced with success by Witzel. 8. Solid food should first be subjected to thorough mastication and insalivation, when it is transferred by the patient from the mouth to a small funnel connected with the distal end of the feeding-tube, from which it is made to enter the stomach by its own weight, by blowing it through the tube, or, finally, it is aspirated into the stomach by the patient's sudden expiratory efforts. 9. Mastication of food, as a preliminary step to its introduction into the stomach, satisfies, at least in part, the sense of hunger, which is not always accomplished even by liberal gastric feeding through the fistula alone.

Allingham [22 Sept.7] points out that by making the incision through the rectus muscle, and not through the linea alba or the linea semilunaris, a wound is obtained which has a certain amount of sphincter-like action; leakage is thus prevented. Cases are also recorded by Bland Sutton. [22 Sept.21] Ewald [69 July 28] has reported that of a a girl, aged 19, on whom gastrostomy was performed on account of œsophageal stricture, apparently caused by an ulcer. The patient was much improved in weight and general health by the operation.

V. Török, of Vienna, [336 Aug.13] demonstrated two specimens of lymphosarcoma of the stomach-wall. In both cases the patients recovered after resection of the stomach. In the first case (operation by von Hacker in March, 1892), a piece of the stomach, twelve centimetres on the lesser and twenty-seven centimetres on the greater curvature, was removed. In the second case (operation by Billroth, in 1888), a piece of the stomach, five centimetres on the lesser and eighteen centimetres on the greater curvature, was exsected.

Antonin Poncet, of Lyons, [827 Mar.30] reports fifteen cases of gastrostomy performed after the method of Tellier. He recommends operation as soon as the diagnosis is clear, and before the patient is enfeebled by improper nutrition. Another case is reported by Pauly, of Lyons. [211 May 8]

David Newman, Glasgow, [6 Jan.2,23; Feb.13,20] also describes four cases in which gastrostomy was successfully performed for œsophageal stricture. In a case described by A. C. de Renzi, [557 Apr.] a vulcanite tube was

inserted into the stomach, and for some months the patient has been able to feed himself at regular intervals by masticating his food and then blowing it down a funnel through the tube into his stomach. At the time of report he was in good health and had gained flesh rapidly.

Briggs [120 Apr.] reports the case of a boy of 15 years, operated upon for impermeable congenital stricture of œsophagus. After the operation the stomach failed to carry on absorption; the patient gradually sank and died on the third day. In another congenital case, aged 54 years, operated upon by A. Dixon, of Henderson, Kentucky, [663 Feb.] the patient recovered. Leakage around the tube was prevented by inserting a soft-rubber ball in a collapsed condition into the stomach and then inflating it. Attached to the ball, and a continuation of it, was a tube by means of which the inflated ball was drawn up tightly against the gastric surface of the opening. A piece of rubber sheeting, covering the external surface, was confined by a rubber ring, held in place by a hard-rubber hollow ball, through which the tube passed, the whole being kept together by a clamp. H. C. Wyman, of Detroit, [339 Dec.,'91] has also operated with success on a similar case. In 124 cases of operation for chronic diseases of the stomach and intestines, performed by Th. Billroth, of Vienna, [13 B.233, H.2] the results were as follow: Of 41 cases of resection of the pylorus, 7 were on men and 34 on women, varying in age from 26 to 58; 28 were for carcinoma and 1 for sarcoma; of these 13 recovered, while 16 were fatal; 12 were cases of cicatricial stenosis, of which 6 recovered and 6 were fatal. Of the 13 cases which survived the operation of resection for carcinoma, 5 died within ten months, 2 after one year, 1 after one year and a half, 1 after two years and a half, and 1 after five and a quarter years. Three women are living still.

Weir, of New York, [1 Dec.5,'91] operated on a man, 58 years of age, according to von Hacker's method. The patient did fairly well until the third day, just before the opening in the stomach was made, when he died suddenly from cardiac syncope. Weir believes that, when tubage has proved of no service, gastrostomy should be employed; and, if done early, the mortality of the operation is not very great, especially when it is possible to perform it in two stages. Rutherford Morison, of Newcastle-on-Tyne, [2 May 7] reports a case of gastrostomy, in a man 45 years old, for

malignant disease of the œsophagus, causing total obstruction. The patient survived four hundred and seven days. He claims that this operation may, even in unfavorable cases, be performed with little risk, and gives a fair chance of prolonging life in tolerable comfort. In a case operated on by Knox, of Glasgow, [213 Jan.] there was renewed difficulty in swallowing shortly after, and a great tendency for the gastric opening to close. Frequent passage of the tube was necessary in order to keep it open. Clutton [2 June 4] contributed the notes of a successful case in a little girl who suffered from stricture of the œsophagus due to the swallowing of caustic soda. Another case of gastrostomy in a child is reported by Burrell. [99 Dec. 31, '91] Ewald [41 Mar. 24; 2 Apr. 16] believes that the peptic function of the stomach is entirely destroyed after the operation, and that the nutrition of the patient is carried on by the intestines. The movements of the stomach are also limited by adhesions, and a certain stagnation of its contents results. For this reason he suggests that the fistula should be made near the pylorus, so that the food can be passed, by means of a tube, directly into the intestines. As long as the patient's strength is maintained, he thinks that gastrostomy cannot be strongly recommended. Helferich, of Munich, [34 Aug. 30] communicated three cases of gastrostomy for carcinoma of the œsophagus. Three weeks after operation they were doing well. Macris, [232 Jan. 30] Godlee, [22 Apr. 20] J. C. Munro, [99 Dec. 31] and Narlys, [232 Jan. 30] each report a case. Henri Meunier [7 June 10] observed a case where obstruction of the œsophagus was due to a tumor back of the thyroid in a phthisical patient.

Cases of successful removal of a portion of the stomach, with recovery of the patient, were reported by Allingham [22 Mar. 9]; Lange [1 May 21]; Fontaine [1043 July; 2 Sept. 24]; N. Stone Scott, Cleveland, O. [222 Feb.]; A. E. Barker [2 Jan. 9]; Robt. F. Weir, of New York [101 May]; F. H. Markoe. [1 Aug. 13] J. W. White, of Philadelphia, [112 Oct.] and Murray [1 Aug. 13] reported similar operations, with fatal results. I. N. Brainerd, [202 Dec. 10, '91] reports an attempted resection of the stomach, which was abandoned; death resulted. James Bell, of Montreal, [282 May] reports a case which resulted fatally on account of a kinking of the first part of the jejunum.

José M. Bofill [931 Mar.; 918 Apr.] prefers gastrostomy to dilatation of the œsophagus for stricture, when this is not caused by pathological processes of themselves necessarily fatal. This excludes malignant

tumors and aneurisms. Operation should be performed early, as soon as the condition is recognized. Of one hundred and thirty-one cases collected by Blum which were treated in this manner, eighty-five died, not from any complications arising from the operation, but from general debility due to the long delay. When it is possible, he recommends two stages in the operation, so as to secure asepsis of the general peritoneal cavity. He therefore waits forty-eight hours after the primary incision before opening the stomach, so as to allow time for adhesions to form. Bofill reports three cases operated on in this manner in Barcelona; the first by Madrazo, the second by Ezquierdo, and the third by himself. Two of these cases died. In one, death was due to some of the sutures giving way. In the other, a fatal result was caused by cicatricial contraction of the pylorus due to a large dose of hydrochloric acid taken by mistake.

Digital Divulsion.—Paul Swain, of Plymouth, $\frac{6}{\text{Jan. 9}}$ publishes two examples of digital divulsion of the pyloric orifice, which show that the procedure is attended with considerable risk. The first patient, 30 years old, died with a return of vomiting on the fifth day. The second, aged 37, died from collapse four hours after the operation. At the autopsy of the second case, a complete rupture of the wall of the stomach was found, although the stretching was very much less than that recommended by Loreta, who is reported to dilate the opening until his fingers are three inches apart.

Pyloroplasty and Pylorectomy.—E. Doyen, of Rheims, $\frac{211}{\text{July 13}}$ reports thirty-two operations performed for stenosis and cancer of the pylorus. Three pyloroplasties were done for stenosis: incision in axis of lesser curvature; one patient recovered; a typical pylorectomy resulted in death. He twice performed Billroth's operation: pylorectomy, with suture of the stomach to the duodenum, and gastro-enterostomy. One patient recovered; the other died from perforation, which occurred at the point of a stitch. He also performed two gastro-enterostomies: one for cancer, which was followed by recovery; the result of the second, done for fibrous stricture, is not known.

Colzi, of Florence, $\frac{589}{\text{May 2}}$ details the case of a man, 42 years old, who had for ten years presented symptoms of gastric ulcer, and for two years symptoms of pyloric stenosis. He performed laparotomy, divided the constriction at the pylorus, which at first would not

admit the little finger, and washed out the stomach freely. An excellent recovery resulted.

James Limont and Frederick Page $\frac{6}{\text{July 9}}$ report the case of a man, 31 years old, who suffered from cicatricial stricture of the pyloric end of the stomach following a blow on the epigastrium. Pyloroplasty was performed and a cure established. Lange $\frac{1}{\text{June 25}}$ reports a case of a man, 29 years old, upon whom a similar operation for stenosis was performed, after the Heineke-Mikulicz method. The patient made an uninterrupted recovery, and was discharged after four weeks. He has since enjoyed excellent health. Frank $\frac{80}{\text{Aug.}}$ and Alexander McCormick, of Sydney, $\frac{2}{\text{Mar. 12}}$ report cases of pylorectomy.

E. Tricomi, of Padua, $\frac{819}{\text{May}}$ reports a case of cicatricial contraction of the pyloric end of the stomach due to ulcer. He removed a portion of the stomach, about as large as a silver dollar, and sewed the remainder together after Czerny's method. The patient made an excellent recovery.

Jessett, of Brompton, $\frac{22}{\text{Sept. 7}}$ gives Rawdon, of Liverpool, the credit of having first performed a successful pylorectomy in his own country. During the last two years nine such cases have been reported. Of these, four recovered: one by Rawdon; one by Bull, of New York; one by A. W. Mayo Robson, and one by Jessett. The latter case was alive and well twelve months after the operation. Jessett believes that the results of operation so far are sufficiently encouraging to recommend it in favorable cases, with every prospect of success so far as the operation is concerned. Patients already doomed to death from the presence of carcinoma should be given the chance of recovery, and if the operation be successful their lives may be prolonged for some considerable time. A. W. Mayo Robson $\frac{2}{\text{June 18}}$ reported two cases of pylorectomy and one of jejunostomy.

Köhler, of Berlin, $\frac{336}{\text{Aug. 13}}$ showed a woman, aged 19 years, on whom von Bardeleben had performed (two years before) pyloroplasty for cicatricial stenosis. The patient, who weighed only 48 pounds before the operation, had gained 65½ pounds subsequently. Frank, of Vienna, $\frac{57}{\text{June 12}}$ reports a case of resection for pyloric carcinoma in a woman aged 52 years. The mass was adherent to the head of the pancreas and colon, which had to be partially denuded to remove the tumor. Six weeks after the

operation a fistula formed (probably from necrosis of the colon); otherwise the patient was much better. After leaving the clinic nothing further was heard of her. Cases are reported by Postempski [589 Jan.5] and Durante, [589 July 7] both of Rome.

Hasslauer, of Bayern, [34 May 24,31] reports five cases of resection of the pylorus for carcinoma from the clinic of Schoenborn in Würzberg. Of the five, three died,—one of collapse after eight days, another of peritonitis on the fifth day, and the third of collapse in a few hours after the operation. The fourth case died, at the end of thirteen months, from a recurrence of the growth. The fifth case was doing well when last heard from, four months after the operation. Successful cases are reported by Colzi [589 May 2; 336 Aug.13] and von Hacker, of Vienna. [84 Nov.21,'91]

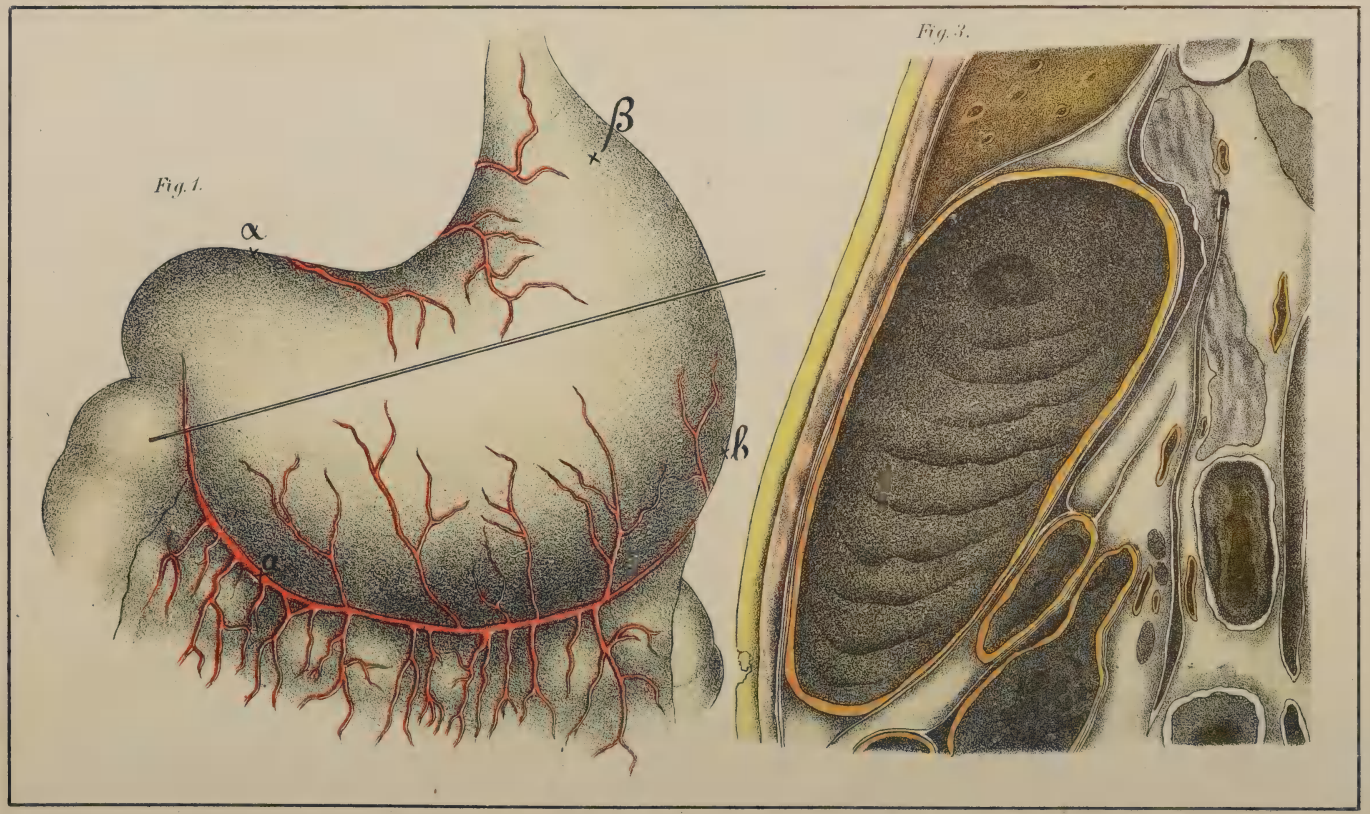
Gastro-enterostomy.—Michaux [100 June 30; 2 July 30] has reported a gastro-enterostomy in a man, aged 42 years, suffering from carcinoma of the stomach. The wound was healed by primary union, and at the end of a month and a half the man was discharged. Michaux [22 July 16] considers that this case demonstrates the great advantages to be obtained by this operation. He does not think it necessary to turn the bile into a new channel by tying the duodenum, as some have advised, and considers that the result in this case proves that that part of the operation is not as important as has been supposed. J. Crawford Renton, of Glasgow, [2 Jan.9] concludes that "the after-treatment of patients who have had this operation performed is most important; feeding by the mouth in small quantity should be commenced two hours after the operation, aided by meat suppositories, the quantity being gradually increased as the patient's strength returns. The points of importance to consider are: 1. Is the operation one to be advised, and when should it be performed? 2. Should the tumor have been removed? 3. Are Senn's plates the best means of effecting union between the stomach and bowel?"

Ch. Périer [10 June 28] reviews ten cases of gastro-enterostomy and pylorectomy operated on by Doyen, of Rheims. In one case the greater portion of the stomach was excised on account of a cancer, and the patient was nourished by means of an œsophageal tube passed some distance into the duodenum. Rivière [211 June] reports two examples of this operation performed by Jaboulay for cancer of the pylorus, and Schwartz [3 Aug.3] one case.

F. T. Paul, of Liverpool, $^{187}_{July}$ describes a modification of Senn's method. He strangulates the connected surfaces of the stomach and intestine, effecting by sloughing a clean circular opening between the bowel and the back of the stomach, which, so far as he is able to judge by experiments on dogs, shows no tendency whatever to contract. In a previous communication $^{187}_{Jan.}$ he had reported a case which recovered. Baroncz, of Lemberg, $^{336}_{July\ 9}$ reports a case of gastro-enterostomy in a man of 60. A hard tumor, the size of a goose's egg, involved not only the pylorus, but also the posterior wall of the stomach, and interfered very materially with the proper digestion of food. After removal of the growth the stomach and jejunum were brought together by plates cut out of raw turnips, and applied after the method recommended by Senn. These plates were passed by the bowels six (6) days after the operation, and the patient made an uninterrupted recovery. The great advantage of making these plates for intestinal anastomosis from turnips is that the material can be readily procured anywhere.

Hankins, of Sydney, $^{267}_{July\ 15}$ reports a case of jejuno-gastrostomy for carcinoma in a man of 45 years, decalcified bone plates being employed. Death resulted after seven months. F. A. Purcell $^{6}_{June\ 4}$ reports a similar operation for pyloric cancer in a woman of 44, who reacted well from the operation and made an excellent recovery.

Breuner, of Linz (on the Danube), $^{8}_{June\ 30}$ describes a new method in the technique of gastro-enterostomy. He unites the mesocolon transversum and the ligamentum gastro-colicum by four silk sutures, then makes an opening (large enough to admit the upper jejunum coil) in the least vascular portion, and unites the jejunum and stomach. He carried out this method in two cases of carcinoma of the pylorus with good results, the patients dying from metastatic carcinoma of the liver. He claims that it does away with the danger of a twist of the colon, which sometimes occurs after Wolfe's method, and it is easier than von Hacker's method. H. Braun, of Königsberg, Prussia, $^{336}_{Aug.\ 13}$ has observed that in several cases of gastro-enterostomy the patients died of inanition from pouring of the stomach contents into the duodenum and jejunum, and from flowing of gall and pancreatic juice into the stomach. He, therefore, recommends that entero-anastomosis should be done at the same time on the jejunum, to obviate this.



Dilated Stomach, (Bircher).

Fig. 1. Front View. Fig. 3. Side Section.

Correspondenzblatt für Schweizer Aerzte.

Fig. 2.

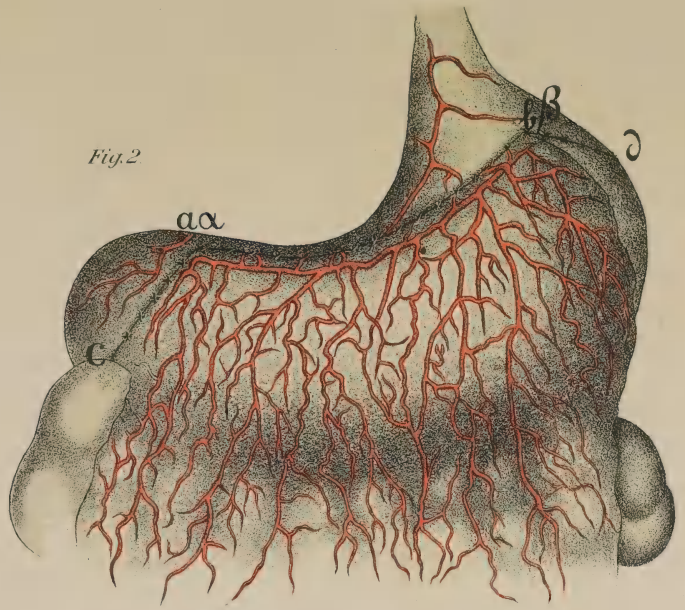
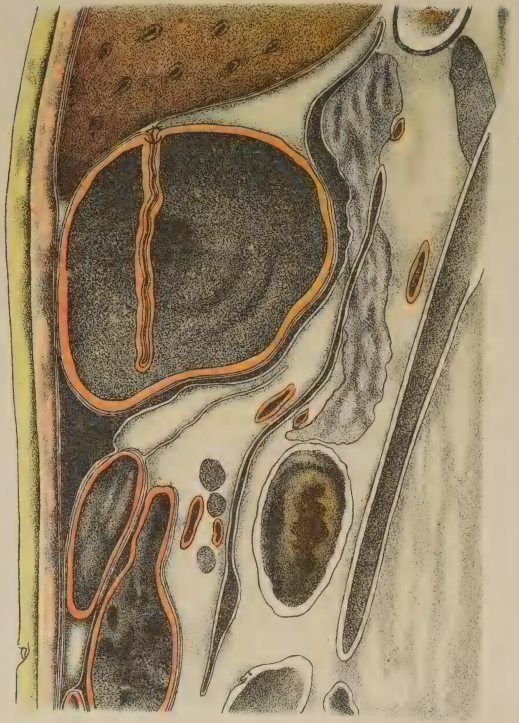


Fig. 4.



Reduced Stomach, (Bircher).

Fig. 2. Front View. Fig 4. Side Section.

Correspondenzblatt für Schweizer Aerzte.

BURK & McFETRIDGE, LITH. PHILA

Hoaster, of Halle, [336 Aug. 13] reported three very successful cases of gastro-enterostomy for carcinoma ventriculi. All the patients were completely relieved of pain. The maximum gain in weight was 27 pounds in ten weeks. Alsberg [34 July 12] demonstrated a case in which he had performed gastro-enterostomy for pyloric carcinoma. At the operation metastatic masses were found in the omentum. The technique was that of Wölfler's and Lauenstein's operation. The patient has greatly improved since the operation, gaining 36 pounds in weight.

Dilatation of the Stomach.—Weir, of New York, [1 July 9] reports a case of gastrorrhaphy to diminish the size of a dilated stomach. The patient, three years previously, at the age of 41, had been operated on by him for pyloric stenosis of two years' duration, gastro-enterostomy being performed. At that time the stomach was distended to such a degree that it would contain between 8 and 10 pints (4 to 5 litres) of fluid, and its lower half reached some three inches below the umbilicus. One year subsequent to the operation he suffered from a renewal of his former symptoms, and was kept under observation for another year. A second operation was performed in March, 1892, when Weir took a tuck in the stomach, sewing its peritoneal surfaces in such a way as to bring about a double fold, equal to the breadth of the hand and almost corresponding to it in length, which projected into the cavity of the stomach. The patient made an excellent recovery, and from that time to the present has lived in the ordinary manner so far as nourishment is concerned. As this operation is very simple in its technique and comparatively free from risk, Weir believes that it may be properly applied to those cases of dilatation of the stomach which are constantly seen in hospital practice, and which are only temporarily improved by the use of lavage, and in which repeated relapses occur.

Bircher, of Aaran, [214 Dec. 1, '91] describes a new operation for the relief of dilatation, and reports three cases. The size of the stomach is diminished by folding a portion of the stomach-walls into the lumen of that organ, making more or less of a plait. The peritoneal surfaces are held together by silk sutures; and the advantage of this procedure is, that union is promptly secured and no loss of peptic mucous membrane is occasioned.

Barling, of Birmingham, [2 Jan. 9] advocates operation for perforated

gastric ulcer. "If left without operation, death in from one to two days follows in a large majority of cases; of the minority, nearly all die in a few days or weeks from mischief extending into the abdomen or thorax, or from a secondary perforation. Relief by operation has hitherto been rarely attempted; but once the possibility of this has been realized by the physician and surgeon alike, and operation is resorted to early after the perforation has occurred, success in a proportion of cases ought to follow."

Weir, of New York, [451 Feb.] believes that left-sided pneumothorax, with previously-existing gastric symptoms, should always lead to suspicion of a perforation of the stomach. Rose [13 Sept. 15] reports two cases in which vomiting of blood occurred after accidents involving violence to the abdomen, and in both of which, laparotomy becoming necessary, it was found that rupture of the stomach had taken place. He regards persistent hæmatemesis as a pathognomonic sign of such lesion, if the stomach has been previously healthy.

PANCREAS.

Schröder, of Breslau, [336 Apr. 30] extirpated, in two instances, cysts of the pancreas which were as large as a child's head. Previous puncture had in each case given fluid containing diastatic ferments. In one case numerous abdominal adhesions made the removal of the cysts extremely difficult. The writer insists that at the time of operation the puncture of the cyst should not be made, but subsequently, after the abdominal incision. M. H. Richardson and J. G. Mumford, of Boston, [99 Jan. 28] performed laparotomy for a cyst of the pancreas in a robust woman of 38 years. Drainage was established, and recovery resulted. A small sinus discharged a watery secretion for a considerable period after the operation, but the discomfort was very slight. No attempt was made to remove the cyst-walls, on account of the feeble condition of the patient at the time of operation. Its walls were, however, stitched to the abdominal parietes, and siphon drainage established. Three months after the operation there was a great improvement in the patient's general condition, without any distressing symptoms. M. H. Richardson [99 May 5] completes the history of another case of pancreatic cyst apparently cured by incision and drainage, previously reported by him. [99 Jan. 29, '91] This patient made a good recovery (apparently) and left the hospital a little over one month after the

first operation, with a drainage-tube in position. In somewhat less than two years a recurrence of the growth occurred, with perforation of the stomach and death, although much relief was experienced after a second operation, in which about 2 quarts (litres) of dark fluid were drawn off from the pancreas by the aspirator. An autopsy demonstrated the great size of the cyst, its thick walls, which could never have been dissected out, and showed also how impossible it would have been to secure free drainage. From this experience the writer recommends the continuous use of a drainage-tube in such cases, as it is clearly dangerous to withdraw the proper means of exit for the secretions of the cyst.

SPLEEN.

At a meeting of the St. Louis Medical Society, $\frac{82}{\text{Dec. 19, 91}}$ Dorsett showed the post-mortem specimens removed from a patient whom he had treated for syphilis. She had complained of severe pain in the region of the spleen, which upon bimanual palpation proved to be floating in the abdomen. Six months before her death that organ was fixed to the abdominal wall by McCandless, by passing a strip of iodoform gauze underneath the spleen, and leaving the ends projecting far enough to tie them over the dressing applied to the external wound. The gauze was left in position for forty-eight hours, until adhesions had taken place. At the autopsy the spleen was found very much enlarged, eight inches in diameter, and very friable. It was adherent to the splenic flexure of the colon, to the cardiac extremity of the stomach, and to some of the omentum. Death was due to intra-ventricular hæmorrhage, probably of syphilitic origin.

Brown, of San Francisco, $\frac{77}{\text{June}}$ reports the case of a woman upon whom an exploratory laparotomy was performed, which demonstrated the presence of an enlarged dislocated three-lobed spleen. Some adhesions around the uterus were broken up; the abdominal cavity was well flushed and the wound closed. She made a satisfactory recovery. Roderick Maclaren $\frac{2}{\text{May 7}}$ treated a case of hydatids of the spleen with free incision and drainage. Four pints (2 litres) of fluid escaped through an incision large enough to admit three fingers, and the ectocyst, which resembled in appearance soaked parchment, was slowly drawn out. Asepsis of the peritoneal cavity was secured by sewing the parietal peritoneum to the tumor with

fine silk and then stitching the skin wound to the spleen, which was in this way freely exposed at the bottom of the incision for three inches. This was performed five days previous to the removal of the fluid. A deep cavity resulted, which a twelve-inch instrument could not fathom. It was washed out twice a day, first with a solution of boric acid, and afterward with a weak solution of iodine. For three weeks membranous shreds came away at every washing. About a month after the operation steady improvement set in, the cavity contracted, and the discharge diminished. About five months subsequent to the operation the sinus had entirely healed, and the patient made an excellent recovery.

Splenectomy.—Von Burckhardt, of Stuttgart, [226 B.43, H.3,4] discusses the question of splenectomy in cases of leukæmia and pseudo-leukæmia. He believes that in cases of advanced leukæmia the danger of secondary or parenchymatous hæmorrhage is very great, whereas in cases in which the enlargement of the spleen is associated with moderately leukæmic blood operation is not contra-indicated. Reports are given of two cases in which, after removal of the spleen, the proportions of white to red blood-corpuscles rose from 1 to 200 to 1 to 150 and from 1 to 105 to 1 to 150. Death in both instances occurred some weeks after the operation. Ruggi, of Boulogne [3 Nov.11,'91] reports a splenectomy in a case of malarial infection. Instead of the usual incision along the border of the right rectus abdominalis he made an incision over the left costal arch. He uses this transverse incision also for tumors of the kidney, pancreas, and liver. It much facilitates both the removal of the tumor and the ligation of the artery. The incision is closed by a simple suture. Montenovesi [589 Nov.23,'91] reported a case of splenectomy on a woman, aged 23, who had suffered from malarial fever for twelve years. The wound was entirely healed twenty-four days after the operation, with notable improvement in the patient's condition. Bacon Saunders, of Bonham, Texas, [85 Mar.] removed a displaced spleen from a woman of 24 years, who made an excellent recovery.

H. Kölliker, of Leipzig, [13 Jan.] advises in all cases an exploratory puncture with a sufficiently large trocar. Splenectomy is thought advisable only in exceptional cases, *i.e.*, where the spleen contains multiple abscesses, where it is gangrenous, or where it is found lying free in an incapsulated abscess. Repeated attempts to

obtain cultures of the pus from these abscesses of the spleen have been entirely without result. Flothmann, of Ems, [34 Dec.9] reports the extirpation of a sarcomatous spleen weighing 4 pounds (2 kilogrammes). The incision was made along the outer border of the rectus. Death occurred from secondary hæmorrhage. The writer advises the greatest care in leaving a sufficiently long stump in such cases. A. Turretta [589 Nov.20,'91] reported an operation on a woman aged 26. Great prostration followed, and fever, which lasted fifty days. Her health returned, and there was no subsequent enlargement of the thyroid gland or lymphatics.

Lindloss, of Christianstad, [3 July 27 ; 2 Aug.20] related a successful case of this operation, in a woman aged 20, for mobility of the organ; no details are given, except that the pedicle was secured with a silk ligature. The wound healed by primary union; a month later the blood showed an increase of red corpuscles and a lessened amount of hæmoglobin. The author regarded the operation as indicated in cases of prolapse, of mobility, of abscess, and of cystic degeneration, as unjustifiable in those of leukæmia, of ague, and of amyloid change.

E. Tricomi, of Padua, [589 June 24,25.27,28] reports three splenectomies performed by himself in the years 1891 and 1892. In the first case—one of leukæmia—great difficulty was experienced in the removal of the spleen, which was enormously hypertrophied. The patient lost much blood, and died four and a half hours after the operation In two cases of simple hyperplasia of the spleen complete recovery followed, and no enlargement of either the thyroid, the lymphatic glands, the tonsils, or of the liver occurred. The writer states that the operation itself in simple cases does not present special difficulties, and thinks that the results prove that the removal of the organ is not attended with serious risk to the patient's future health.

Piasesli [259 Mar.15] reports a case of hydatid cyst of the spleen, aspirated and injected with corrosive-sublimate solution, with successful result. Paul Gaston and Charles Vallée, of Paris, [118 Sept.] have contributed an article on the study of the spleen in children. From the statistics of Frerichs and eighty autopsies performed in the service of Sevestre, they have formulated the following rules: 1. The weight and dimensions of the normal spleen vary in accordance with the weight and dimensions of the body.

2. The maximum weight of the spleen in proportion to the weight of the body is at eight years. 3. The weight of the spleen at about a year old being in the neighborhood of 32 grammes, and the body weighing 8 kilos, the increase in weight of the spleen should be 10 grammes yearly, and that of the body in the neighborhood of 1500 grammes, up to the age when the spleen has its greatest relative weight,—*i.e.*, 8 years. After this period the spleen increases only about 6 grammes [yearly?] It ceases to grow at 45 years. 4. The increase in weight of the spleen seems more considerable than that of other organs. In adult life it weighs about an eighth as much as the liver.

In general (1) a large spleen means either bad nutrition or an infectious disease; (2) demonstration of an enlarged spleen in a child is of more value for purposes of prognosis, in case it continues to enlarge or diminishes, than for purposes of diagnosis.

LIVER.

W. W. Keen, of Philadelphia, $^{99}_{\text{Apr. 28}}$ reports a successful case of resection for an adenoma of the bile-ducts, with a table of 20 recorded cases of hepatic operations. Among the 20 cases the result in one was doubtful. Seventeen of the other 19 recovered, and only 2 died,—1 on the day of the operation, probably from shock; the other on the twelfth day, from sepsis. The writer concludes that (*a*) large portions of the liver can be removed without undue disturbance of the function of that organ; (*b*) the escape of bile into the peritoneal cavity is not a usual phenomenon after such an operation, and it may be generally prevented either by searing the raw surface of the liver, by ligation, or by securing the stump in the abdominal wound, and even if the bile does enter the peritoneal cavity the result is not necessarily fatal; (*c*) hæmorrhage need not be greatly feared, as vessels can often be tied separately or *en masse*, cut through by the cautery, or controlled by pressure; (*d*) resection or amputation is best done either by enucleation, by the cautery, or with the knife or scissors,—preferably, perhaps, in the order named; (*e*) the mortality thus far has only been about 10 per cent. In this connection it is interesting to note the experiments of Roger $^{3}_{\text{June 15}}$; $^{6}_{\text{July 2}}$ upon extirpation of the liver in frogs. Removal of this organ in the frog does not involve an immediately fatal issue, as is the case in mammals. Physiolo-

gists differ, however, as to the length of time these frogs can survive. One of the animals experimented upon by Roger lived for three or four days in water which was not renewed, while another frog, kept in running water, lived fourteen days.

Abscess.—Fontan, of Paris, [3 Dec.30,'91; 16 June 1] described two cases of abscess of the liver which he had treated by free incision and curetting, in the belief that incision and irrigation alone were insufficient to remove the shreds of gangrenous tissue which were often left adherent to the walls of the abscess-cavity and prolonged the suppuration. Scraping was gently done with a blunt curette, the index finger acting as a guide, and was accompanied by only slight bleeding. In the discussion which followed, Pozzi remarked that he had seen this method practiced in Egypt and Athens, and that it had the advantage of exposing and bringing about the evacuation of other abscesses, which might otherwise have been overlooked. At the same time, he did not consider this a sufficient advantage to outweigh the risks of the procedure—hæmorrhage and the opening of the biliary ducts. Monod condemned the practice as not only dangerous, but useless, and quoted cases in support of his views.

W. Körte [41 July 28; 22 Aug.24] regards the formation of gall-stones as the most frequent cause of this trouble in Germany. These stones, becoming impacted in the biliary ducts, produce stagnation of the bile with decomposition, subsequent inflammation and suppuration. Ross, of Toronto, Canada, [1003 Apr.] writes on the dangers of gall-stones, with a plea for early laparotomy in obscure abdominal disease. In an historical review of different methods of treating abscess of the liver, Pedro P. Peredo [673 Feb.] discussed a method used by a famous Mexican physician, Jimenez. This surgeon made an oblique subcutaneous puncture in the intercostal spaces, and subsequently modified his method by leaving the cannula *in situ*. In 297 cases observed by Jimenez, 198 were on the convex surface of the right lobe, with 243 deaths. His mortality with other methods had been 82 per cent.

P. M. Ellis, of Kamptee, India, [2 Feb.27] in speaking of the method advocated by Macleod, [2 Dec.26,'91] of using a rigid metal cannula in preference to rubber tubes for the purpose of drainage, raises the objection to this method that it is impossible to secure free drainage because the tube soon becomes blocked by pus and *débris* from

the hepatic tissue. The plan he has adopted in a series of successful cases is to introduce two non-perforated rubber tubes, side by side, into the cavity at the time of operation; then, by inserting the nozzle of an ordinary irrigator into one, it is possible to wash or siphon out the contents of the abscess-cavity once or twice a day with a weak solution of iodine or carbolic acid. In this way, not only is the cavity kept aseptic, and any tendency of the pus to gravitate into the most dependent portions of the organ obviated, but the growth of granulation tissue is accelerated. If the tubes are, in the first instance, pushed to the bottom of the cavity and gradually withdrawn as it closes, no necessity for further interference is likely to arise. The real secret in the treatment of these cases is a sufficiently large incision through the external tissues in the first instance. Neil Macleod, of Shanghai, [2 Apr.30] mentions a case seen in consultation where death resulted from failure to maintain free drainage. There was great difficulty in introducing a rubber tube and retaining it in position, in an abscess which was opened through an intercostal space. In another instance the flexible-rubber tube was completely closed by the grasp of the thickened liver-capsule, and satisfactory drainage could not be established until it was replaced by a silver tube.

J. R. Thornton [2051 Mar.2,'91]; J. C. Reeve, of Dayton, O., [1 May 28] and M. T. Scott, of Kentucky, [224 Aug.13] have also contributed valuable articles on the surgical treatment of the liver. Successful cases of incision and drainage are reported by Shaw, of India [6 Aug.20]; J. B. Deaver, of Philadelphia [451 Apr.]; A. G. Gerster, of New York [101 Aug.]; John McMunn, of London [6 Feb.20]; A. D. McIntyre, of Sipri, India [239 Jan.]; Birch, of Calcutta [239 Sept.]; J. C. Irish, of Lowell, Mass. [99 Apr.28]; John Curnow and John Smith [6 Dec.26,'91]; Golding Bird [22 June 8]; Henry Jacobson, of St. Louis [364 Sept.1]; William Williams, of Pittsburg, Kan. [430 Jan.]; R. L. Gibbon, of Charlotte, N. C. [43 Feb.]; G. S. Thompson, of Deesa, India [239 Mar.]; M. Monod [100 Jan.2; 31 Jan.7; 161 May]; F. A. Philippi, of Westphalia. [2 Feb.13] Unsuccessful cases are reported by F. T. Heuston, of London [2 Apr.2]; J. C. Irish, of Lowell, Mass. [99 Apr.23]; and Monod, of Paris. [100 Jan.2]

Patrick Manson [2 Jan.22] describes an operation which he has devised for the relief of abscess of the liver, which, however, can be applied with equal success to abscess elsewhere. The various parts of the necessary apparatus are shown in wood-cuts.

Cauvy [195 Dec.,'91] details a case where an abscess of this organ fol-

lowed acute enteritis. The abscess was opened and a slow recovery resulted. Raimundo Menocal [773 Apr.5 ; 996 June 25] records a case in which an abscess opened spontaneously between the tenth and eleventh ribs. A resection of the eleventh rib, antiseptic irrigation, and packing with iodoform gauze resulted in recovery. This writer concludes (1) that only 2 per cent. of such cases open through the thoracic walls ; (2) free incision with resection of a rib is the best method of treatment, and secures the promptest recovery. Garcia Rizo [459 No.3] has reported a successful operation of the kind.

Hydatid Cysts.—Bouilly, of Paris, [22 May 4] has treated five cases by incision and lost but one. In each case he fixed the cyst to the wall of the abdomen. In ten other cases, after completely emptying the cyst, he injected one teaspoonful of a solution of sublimate (1–1000), and obtained eight cures. Guy N. Stephen, of Cyprus, [2 Sept.10] believes that, while the operation itself presents no peculiar dangers, it is often difficult to prevent sepsis. He therefore suggests the following method to avert this danger: " After exposing the cyst, and allowing sufficient time to elapse both for firm adhesions to form—I use multiple sutures of fine, sterilized silk—and for the flesh wound to cover itself with protective granulations, open the cyst as freely as the flesh wound will allow ; then with the forefinger slightly push the ectocyst from the surrounding tissue, and along the finger slide a metal tube connected with an irrigator, held about eight feet from the ground, and filled with twice-boiled water, of a temperature of not less than 105° to 110° F. (40.6° to 43.3° C.). The force of the water falling from this height completely detaches the ectocyst and forces it, whole and untorn, out of the wound. When the ectocyst is evacuated, continue to irrigate, gently smoothing the tube over the whole surface of the false cyst until all the shreds of lowly-organized fibrous tissue which united the true and false cysts have been driven out of the wound and the stream of water returns perfectly clean and clear. Dress with dry mercury cotton-wool. The metal tube which I use is simply a full-sized silver catheter with the end filed off at an angle."

C. Mansell-Moullin [2 Jan.30] reports a lad of 19 who made a slow recovery after removal of a cyst from the liver. Barling [2 Mar.19] and Alex. G. R. Foulerton [6 Mar.19] each report a case of successful

laparotomy for suppurating hydatid cyst. Schwartz, [3] May 25; [22] June 1 Dudley Tait, of San Francisco, [19] June 4 and G. H. Fink [239] Aug. 1 also report cases which terminated favorably after operation.

All of the three cases observed by W. Körte, of Berlin, [19] Aug. 27 admitted having had dogs about them constantly. His treatment always consisted in exposing the sac, stitching it fast to the abdominal wound, and opening it at one sitting. Two recovered and one died four weeks after the operation. Alex. G. R. Foulerton [6] Mar. 19; Dubreuilh, of Montpellier [55] Dec. 5, '91; Maynard, of Toulouse [1038] Nov. 27, '91; Verrier [24] Dec. 20, '91; Paul Petit, of Paris [24] Jan. 31; L. Doyen, of Rheims [211] Aug. 14; and M. H. Richardson, of Boston, [99] Apr. 28 each report a case successfully treated by operation. Paul Petit [194] Dec. 16, '91 reports a case of the removal of a cyst containing 6 quarts (3 litres) of liquid. Kretz, of Vienna, reports the result of an autopsy on a girl of 22 years, who had committed suicide. Billroth had removed an echinococcus cyst from the left lobe of the liver a year previous. Only the right lobe of that organ, slightly hypertrophied, remained. On the left of the round ligament of the liver a band of tissue was found connected with the laparotomy wound. The liver-tissue had entirely healed.

Traumatism.—Homer Gage, of Worcester, Mass., [99] Apr. 28 has collected, with the assistance of R. Lorini, of Washington, the records of 272 cases of wounds and injuries of the liver. For convenience of classification they divide these cases into (1) those due to direct and (2) those due to indirect violence. "Of the direct injuries, we find 164 cases with 58 deaths, a mortality of 35.3 per cent. Of the indirect, 108 cases with 92 deaths, a mortality of 85.2 per cent. Dividing the former class again into two groups, we find that, of 54 punctured or incised wounds, 24, or 44 per cent., proved fatal, while of 110 gunshot wounds only 34, or 30 per cent., were mortal. Of the 272 cases, 150, or 50.5 per cent., died. These figures correspond very closely with the tables of Edler, which showed a mortality of 39.1 per cent. after shot wounds and 55 per cent. of all cases. It will be seen, therefore, that wounds of the liver are far from necessarily fatal, and that from penetrating wounds nearly two-thirds of all cases may be expected to recover."

Gage presented the history of a boy of 15, seen in consultation, upon whom he operated for gunshot wound of the liver

twenty-four days after injury. This case illustrates the extent to which the liver may be mutilated without interference with its functions. The boy is in perfect health. W. Körte, of Berlin, [69 Mar.17] has performed laparotomy on two cases of gunshot wounds of the liver, with recovery in both instances. He also records [19 Aug.27] two additional cases, accompanied with injuries elsewhere, in which death resulted.

Fenger [99 June 30] reported a case of rupture of the liver, resulting from a fall through an elevator-shaft. It was shown, a year later, that considerable hæmorrhage had taken place without evil results. Thorn, of Toledo, and Walker, of Tennessee, [99 June 30] also reported cases. These terminated fatally without operation. Operative procedures resulted in recovery in cases of rupture of the liver and gall-bladder, reported by Hermes [23 Apr.13] and Dugan. [2241 Apr.23] Edwin Ricketts, of Cincinnati, [53 Jan.23, Feb.13] records the case of a youth of 16, who was shot through the liver with a 32-calibre revolver. The ball lodged just above the right kidney. He was treated on the expectant plan with good results. A successful case was also reported by J. T. Jelks, of Hot Springs, Ark. [61 June 7; 22 Apr.13]

Hans Kehr [336 Aug.6] relates the history of a robust man of 30 years upon whom he operated for gunshot wound of the gall-bladder. Four weeks later the patient was well. A. Brenner, of Linz [8 May 5] reports a case of laparotomy for gunshot wound of the liver in a boy aged 14 years. The operation was performed two days after the injury. A drainage-tube surrounded with iodoform gauze and an iodoform-gauze tampon were used. The latter was allowed to remain in position for five days, the drainage-tube twenty days. The patient recovered without fever or other complications. Tiffany, of Baltimore, [451 Apr.] records the history of a man of 25 years from whom he successfully removed a small, solid tumor of the liver. Thomas, of Berlin, [69 July 14] reports a case of rupture of the gall-bladder due to a blow upon the abdomen. Three weeks after the accident laparotomy was performed with the removal of some three litres of a brownish fluid containing numerous blood-clots. Convalescence was slow, but complete.

H. C. Dalton, of St. Louis, Mo., [663 Feb.] performed laparotomy on a colored man of 55 years for rupture of the liver and spleen. Recovery resulted.

Examination.—F. Glénard, of Lyons, [211 Jan.3,10,17] details, at length,

a method for the bimanual examination of the liver, which should be adopted in all cases where the symptoms denote any complications in the viscera of the abdomen. In all cases of hepatic symptoms examination should be made not only during the crises of the attacks, but also during the intervals between them. Verneuil [22 Aug.10] recommends a very careful examination of the liver before undertaking even the most trivial operation. He cites three operative cases which terminated fatally on account of extensive hepatic disease, which was unrecognized before death. Bewley, after referring to the bimanual method [16 Sept.] of palpating the gall-bladder according to Rheinstein, [4 No.52,'91] suggests another method of examining the liver in cases in which it projects below the costal arch, as follows: The patient sits upright; the investigator with his left hand "fixes" the liver by grasping it with the thumb placed in front close to the edge of the ribs, and the fingers behind. He then palpates the liver with his right hand, placing the thumb on the upper surface of it, and sinking the fingers as far as possible under its anterior margin. In this manner the fissure for the gall-bladder and the umbilical fissure and the gall-bladder can be felt, and the contents of the latter may be pressed out. In some cases it is even possible to feel structures situated in the portal fissure.

Savigny [35 No.8; 80 July 15] speaks well of the application of some form of mechanical treatment to relieve all the disagreeable symptoms attending upon movable liver, as the attempts so far to suture that organ to the abdominal parietes have not been successful.

Hepatic Phlebotomy. — George Harley, of London, [99 July 7] advocates visceral phlebotomy on every accessible internal organ, as he considers this procedure far superior to leeching or cupping. He reports two cases of hepatic phlebotomy. In one the liver was very much enlarged, and in the other there were numerous small abscesses. Recovery resulted in both cases.

GALL-BLADDER.

Péan, of Paris, [100 Apr.16] classifies the operations on the gall-bladder as follows: (1) ideal cholecystotomy, or the incision of the gall-bladder, followed by immediate suture of the wound; (2) incision followed by suture of the parietal and cystic peritoneum and walls, or ordinary cholecystotomy; (3) the establishment of a communication between the bladder and a portion of the intestine, or

cholecystenterostomy; (4) the removal of the entire gall-bladder, or cholecystectomy.

The incision for all these operations should be three-quarters of an inch from the cartilage of the ninth rib, in a line parallel with the general direction of that bone. The skin incision should be free, and include the cellular tissues in a diagonal direction from the median line. The aponeuroses and muscles are then divided and all bleeding stopped. The peritoneum is next opened for a distance of from two to two and a half inches. The remaining steps in the operation depend largely upon the conditions present. In some cases the adhesions are so dense that dissection of the gall-bladder from its surroundings is impossible. Ideal cholecystotomy is the preferable method of procedure when calculi can be removed and there is no obstruction of the ducts. The writer records one case of cholecystenterostomy which he records as a difficult operation, not often indicated except where the duct is occluded.

Cholecystenterostomy. — Czerny, of Heidelberg, $\frac{69}{\text{June 8}}$ details briefly three cases in which he performed this operation. Terrillon, of Paris, $\frac{36}{\text{Aug.}}$ has reported eleven cases of gall-bladder surgery; eight cholecystotomies with six cures, one resulting fistula, and one death; two cholecystectomies, and one exploratory operation. Michaux and Richelot, of Paris, and Boeckel, of Strassburg, $\frac{91}{\text{May 10}}$ also contributed cases. Kümmel, $\frac{34}{\text{Mar.29}}$ in speaking of the surgery of the gall-bladder, mentioned a man, aged 40, on whom he performed cholecystotomy, removing over one hundred stones. Afterward stones aggregating two hundred and thirty-three were discharged from a fistula, and as the fistula did not close the gall-bladder was extirpated. Complete recovery resulted. Helferich, of Munich, $\frac{34}{\text{Aug.30}}$ reports a case of abscess of the gall-bladder due to a stone lodged in the cystic duct, where the entire gall-bladder and duct were removed by cholecystectomy. Fourteen days after the operation complete healing resulted.

Ignatow, $\frac{336}{\text{No.9}}$; $\frac{157}{\text{Sept.}}$ basing his conclusions upon a critical study of two hundred and seventy-eight cases of operative interference in affections of the gall-bladder, comes to the following conclusions: 1. Interference is demanded in all cases in which the paroxysms of pain are such as to suggest obstruction of the cystic or common duct. 2. Cholecystotomy is to be considered as the typical operation. 3. This procedure, and cholecystectomy as well, offers the

lowest rate of mortality. 4. In all inveterate cases the walls of the gall-bladder, more or less, undergo pathological changes. Normal cholecystotomy is recommended in this class of cases. 5. Cholecystectomy, inasmuch as it does not affect the formation of the gall-stones, cannot be regarded as a radical treatment; therefore, it should be restricted in its employment to malignant disease of the gall-bladder and well-defined obstruction of the cystic duct. 6. Ideal cholecystotomy should always be employed in recent cases. Statistics do not support the generally received notion that this procedure is fraught with danger. 7. Cholecystenterostomy is to be reserved for cases in which, malignant disease being excluded, a well-defined obstruction of the common duct is present.

Gaston, of Atlanta, Ga., [99 June 30] states that, where the duct is occluded by some other cause than impacted stone, it is generally necessary to remove the gall-bladder. The dissection of its upper portion from the lower is a difficult operation and attended with risk. He is accustomed to leave this portion of the bladder *in situ*. All stone obstructions should be removed, and an external opening only should be regarded merely as a temporary expedient. The gall-bladder should be united with the intestine. While it is most desirable to establish the fistula with the duodenum, one with the jejunum would not prove less useful; but one with the colon gave an unsatisfactory result. C. T. Parker, of New York, [1 July 30] has also contributed a valuable article on the indications for operation.

Terrier, of Paris, [73 Nos.16,17,18; 70 May to Sept.; 80 June 15] has performed eight cholecystectomies, one cholecystotomy, three cholecystostomies, one cholecystenterostomy, and one choledochotomy. Of the eight cases of cholecystectomy, seven recovered. The first was performed in 1886, and has been well since that time. In the case of cholecystotomy the adhesions were so tight that the gall-bladder could not be sutured to the abdominal walls. This patient died. All three cases of cholecystostomy recovered. In the case of cholecystenterostomy operation was required on account of an obstructing tumor at the head of the pancreas. The patient lived six months after surgical intervention.

Lindner, of Berlin, [69 June 8] concludes, after seven observations, that in cases with a large number of *small* stones cholecystectomy is

usually unadvisable. He reports one case in which, after breaking up extensive adhesions surrounding the gall-bladder, the viscus, with a large piece of the liver, was sewn into the abdominal wound. In the discussion following Lindner's paper, Langenbuch stated that he had operated upon at least thirty cases of cholelithiasis in which the mucous membrane of the gall-bladder had been destroyed and the muscular tissue had undergone a fatty or a fibrous change. He considered cholecystectomy was permissible in such cases. Körte insisted that, before allowing the gall-bladder to remain after it has been opened, one must have (1) a sufficient opening; (2) healthy tissues; (3) absence of pus in the contents; (4) proof that all concretions have been removed. O. Gärtner, of Wurtemberg, $^{133}_{\text{May 20}}$ performed laparotomy for intense pain in the region of the gall-bladder. The latter was found adherent to a loop of intestine by recent bands of lymph. No evidence of gall-stone. The adhesions were easily broken up and the gall-bladder stitched to the abdominal wound. The pain entirely disappeared.

Choledochotomy.—Küster $^{226}_{\text{B.43,H.1}}$ reports the case of a woman, aged 49 years, in whom he obtained rapid recovery, the jaundice disappearing completely. The author recommends choledochotomy in all cases of calculi in the common duct, where the latter is accessible and the stone can be felt. The operation has been performed seven times (inclusive of the author's cases), with only one death. Bland Sutton $^{2}_{\text{Mar.5}}$ removed a number of gall-stones after incising the duct close to the wall of the duodenum. The patient left the hospital in good condition twenty-five days after the operation.

A. Fraenkel, of Vienna, $^{336}_{\text{Sept.3}}$ has published two cases in which the symptoms were all those of biliary calculi, except the presence of actual calculi in the fæces and the presence of any tumor along the liver-border. After operation it was found that in one of the instances there was an entire absence of the gall-bladder, but with a small, indurated mass adherent to the liver at its site. In the second instance, the lower end of a perfectly normal gall-bladder was bound down by adhesions of a pseudomembranous character to the posterior surface of the liver. Upon breaking up the adhesions and carefully stitching, relief from the symptoms ensued in each case.

Frank, of Vienna, [57 Nov.29,'91] reports a case in which the gall-duct was opened and a calculus removed. Recovery in fourteen days. In the discussion following this report Billroth said that ventral hernia less frequently followed the oblique than the vertical incision. H. O. Marcy, of Boston, [61 Dec.20,'91] records five cases which illustrate a variety of conditions calling for operative interference. M. H. Richardson, of Boston, [99 Apr.23] places a number of cases on record: (*a*) One of impacted gall-stones; perforation; death without operations. (*b*) Four exploratory operations on the gall-bladder. (*c*) Six cholecystotomies for gall-stones. In the same journal S. J. Mixter, of Boston, details a case of retention-cyst of the gall-bladder, with operation and recovery.

With regard to catheterization of the bile-ducts (for which, of course, a cholecystotomy or the existence of a biliary fistula is an essential condition), Terrier [363 Sept.18] thinks that it is apt to be rendered easier by the dilatation attending disease; that no rules can be laid down for its performance; that it should never be forced, even with the aid of a finger introduced within the abdomen. He advises the employment of olivary bougies, of Béniqué catheters, or of silver instruments; preferring the flexible ones, and urging that they should be thoroughly sterilized before using.

A. Vander Veer [2160 Sept.,'91] has reported three cases, with special reference to the treatment of calculus lodging in the common duct. Joseph Eastman, of Indianapolis, Ind., [53 Dec.12,'91] in an experience with over three hundred abdominal sections, has operated for gall-stones twelve times,—eleven times by cholecystotomy and once by cholecystectomy. In two cases death occurred, but was in no way traceable to the operation. Körte [404 No.40; 2 June 11] advocates, in suitable cases, immediate closure of the orifice in the gall-bladder by sutures in cholecystotomy, and return of this organ to its normal position in the abdomen. Five cases are reported in which this was done successfully.

Merkel, of Nuremberg, [34 Sept.13] distinguishes two operations of cholecystotomy: First, that in which a primary laparotomy is made and the gall-bladder stitched to the abdominal wound. After some days, during which the peritoneum of the gall-bladder unites firmly with the parietal peritoneum, an incision is made directly into the organ, the interior explored, and the entire wound closed. Second, that in which the gall-bladder is opened, emptied, stitched, and replaced at one operation. Of these two he prefers the first,

in spite of the fact that there is usually a temporary fistula. He reports a successful case with absence of any biliary symptoms.

Goldenberg, of Odessa, $^{69}_{\text{Feb.4}}$ reports a case of suppurative cholangitis, in which the diagnosis was made from the following symptoms: Marked general weakness; severe pain in the region of the liver; progressive enlargement of that organ; slight icterus, irregular fever; and, upon puncture, the discharge of a dirty, bloody fluid containing pus-corpuscles. Section fully confirmed the diagnosis. Zeller, of Stuttgart, $^{133}_{\text{Aug.16}}$ reports a case of cholecystotomy with removal of three hundred and sixty-one gall-stones, but without a drop of bile. There had been absolutely no icterus. The gall-bladder was sewn to the abdominal wound, and a very fine fistula has resulted, which discharges a small quantity of bile. R. Frank, of Vienna, $^{57}_{\text{June 12}}$ reports a case of biliary calculus in which, after opening the gall-bladder, extirpation was thought necessary on account of the thinness and delicacy of its walls. Complete success attended the operation, without resulting fistula. The operation was begun under the impression that the case was one of floating kidney.

Robert Abbe, of New York, $^{1}_{\text{Jan.30}}$ records a case which illustrates the feasibility and safety of the so-called "ideal operation." Four other cases were in perfect health six months to three years after the operation. Rufus B. Hall, of Cincinnati, $^{2160}_{\text{Sept.24}}$ reports seven cases, and would hesitate to advise operation in cases where there had been complete obstruction of the common duct for from seven to nine weeks. The power of recuperation is then so feeble that a fatal termination is to be expected. Of eight cases published by Terrier, $^{91}_{\text{July}}$ two were fatal. W. J. Mayo, of Rochester, Minn., $^{105}_{\text{Apr.1}}$ reports three operative cases, all of which recovered. A. T. Cabot, $^{99}_{\text{Apr.28}}$ George W. Gay, $^{99}_{\text{Apr.28}}$ and W. B. Rogers, of Memphis, Tenn., $^{849}_{\text{June}}$ each report two cases, of which three recovered.

Lawson Tait, of London $^{2}_{\text{Jan.9}}$; R. D. Pinnock, of the Ballarat Hospital, Australia $^{285}_{\text{Nov.,'91}}$; H. T. Byford, of Chicago $^{1003}_{\text{Jan.}}$; J. F. A. Adams, of Pittsfield, Mass. $^{99}_{\text{Jan.21}}$; A. Böger, $^{336}_{\text{Mar.19}}$ Guelliot and Moret $^{577}_{\text{Apr.}}$; W. E. Ashton, of Philadelphia $^{80}_{\text{May}}$; H. Lindner, $^{4}_{\text{No.11;}}$ $^{16}_{\text{June1}}$ Maclean $^{1}_{\text{July 9}}$; Braine, of Paris $^{62}_{\text{July}}$; Rodgers $^{19}_{\text{Aug.13}}$; W. H. Myers, of Fort Wayne, Ind. $^{61}_{\text{Aug.6}}$; and Charles N. Smith, of Toledo, Ohio, each report a case of cholecystotomy with successful results. In some of these cases a biliary fistula persisted for a considerable period.

C. E. Todd, [267 Dec.15,'91] W. W. Seymour, of Troy, N. Y. [61 Jan.23]; Henri Brodier, [7 Feb.] Guyot, [3 Mar.9] Leus, [3 June 22] and W. E. B. Davis, [1003 May] each report a case which resulted fatally after operation.

Silcock, [22 Dec.16,'91] Hulke, [22 May 25] M. H. Richardson [99 Jan.21,Aug.18]; John B. Hamilton, of Chicago [451 Feb.]; Haward, of London [22 May 18]; Pearce Gould, [22 June 1,29] and T. A. McGraw, [185 Sept.] have also made brief additions to the literature of cholecystotomy. Helferich, of Greifswald [69 Feb.25; 2 Mar.19]; Chavasse, of Birmingham [6 Mar.12]; and Richelot, [100 p.482] each report a case upon whom this operation was successfully performed.

Winni discussed the question of the action of normal bile on the peritoneum, at the Sixth Congress of the Italian Surgical Society at Bologna, [589 May 12] and comes to the following conclusions: 1. Normal bile has no septic action, and small amounts do not irritate the peritoneum, because rapidly absorbed. 2. Large effusions, on the other hand, give rise to fatal sero-fibrinous peritonitis, unless removed by surgical interference. The indications for operation would be the discovery of bile-pigment in the urine, the occurrence of which follows immediately, as experiments in animals have proved the passage of bile into the peritoneal cavity. W. E. B. Davis, of Rome, Ga., [61 June 7; 99 June 30] believes that bile is not a septic fluid; that it causes peritonitis by irritation, and then only when it is poured out in large quantities.

OMENTUM.

Bland Sutton [22 Sept.28] operated on a woman of 31, for a large, soft growth in Douglas's fossa, which proved to be a collection of hydatid cysts of the omentum. A dozen or more were enucleated, the abdomen was flushed with hot water, and a large drainage-tube inserted. In a similar case treated in the same way, suppuration occurred in the walls of the cysts and an excellent recovery resulted. A. Mueller, of Yackandandah, Victoria, [267 Jan.15] successfully removed a cyst the size of an emu-egg from the omentum of a boy of 8 years.

Goullioud [211 May 1] removed the larger omentum in its entirety on account of enormous hydatid cysts. For two years the woman, aged 29, who kept many hunting dogs, had had abdominal pain, which became intense and soon prevented her from working. She complained of frequent regurgitation of food, or sometimes of painful vomiting, either of bilious or alimentary matter. Three

months after an attack of influenza a multilobular abdominal tumor was made out, which constantly increased in size. Examination of the abdomen showed multilobular masses, resisting or fluctuating, extending from the lower border of the ribs to the pubes. It much resembled an ovarian cyst, being felt in the vagina and causing a retroversion of the uterus. Another fluctuating mass projected beneath the liver, and other tumors occupied the umbilical region. A laparotomy was performed, the diagnosis lying between ovarian cyst and an omental tumor. Upon opening the abdomen the diagnosis of hydatids was manifest. The cysts were not adherent to the small intestine, but by slight adhesions with the cæcum and at one point with the abdominal parietes. To prevent twisting and narrowing of the stomach, and also to stop hæmorrhage, he put in some fifteen stitches along the border of that organ. Drainage was maintained from Douglas's pouch by iodoform gauze, and the abdomen was sutured. Considerable amelioration of the digestive symptoms followed the operation.

MESENTERY.

A. Fraentzel $^{301}_{\text{xxx,2,U.3,p.129}}$; $^{13}_{\text{June}}$ reports a case of cyst of the mesentery operated upon by Lücke with success by incision and drainage. Of the thirty cases collected by Augagneur, he accepts only nine as positive in diagnosis. Cysts form about one-third of the tumors of the mesentery. The diagnostic peculiarities are their first appearance in the region of the umbilicus; their free mobility in the abdomen; their intermittent growth, and the paroxysmal pains which they induce. Sometimes they are painless. An excellent table is given of the differential diagnosis. In regard to treatment, stress is laid on the necessity of avoiding injury to the mesentery itself. Sometimes the cysts can be enucleated from the mesentery, and when it is possible this should be done. If the adhesions are too firm, as much of the cyst as has been enucleated should be cut away and the rest drained. If it be evident from the first that extirpation is impossible, the cyst-wall is to be secured to the lips of the abdominal wound and incised after the adhesions have been shut off from the general peritoneal cavity.

J. A. Goggans, of Alexander City, Ala., $^{207}_{\text{Feb.}}$ performed abdominal section, upon a girl of 21, for a cyst of the mesentery. An attempt to enucleate the cyst was followed by such profuse

hæmorrhage that the idea of enucleation was abandoned. The attachments were high up in the abdomen and in the region of the left kidney. After incising the cavity, more than a gallon (4 litres) of dark-colored fluid was evacuated. The cyst was irrigated with hot water, its incised walls stitched to the upper angle of the abdominal incision, an ordinary six-inch glass tube introduced to the bottom of the sac, and the abdominal incision closed with silk-worm-gut sutures. The tumor appeared to be between the layers of the mesentery. The patient made an excellent recovery. James McCann, of Pittsburgh, $^{161}_{\text{Mar.}}$ operated upon a German, aged 40 years, and removed a sarcoma of the mesentery. He performed, at the same time, a resection of the small intestine. Three months after the operation the patient reported in good health. James Macleod, of Charlottetown, $^{284}_{\text{July}}$ has put on record the important points in the history of a woman who was operated upon for a tumor filling almost the entire abdominal cavity. The tumor was too extensive to be removed. The patient never rallied from the shock, and died nine hours after the operation in collapse.

J. Thiroloix, of Paris, $^{7}_{\text{Mar.18}}$ has reported in detail (with histological and bacteriological examinations) a case of pigmented lymphosarcoma of the mesentery with multiple hæmorrhagic foci, acute anæmia, rapid cachexia, and death from septicæmia. Peyrot, of Paris, $^{3}_{\text{June1}}$ has reported a case of laparotomy for supposed multilocular cyst of the ovary; upon opening the abdomen a large myxolipoma of the mesentery was found. Tuffier, of Paris, $^{3}_{\text{Aug.3}}$ reports two interesting cases, one a man of 48; the second, a boy of 12 years. Laparotomy in each case was followed by recovery. Brunet $^{70}_{\text{Aug.21}}$ showed a specimen of multiple hydatid cysts of the mesentery and liver removed by laparotomy; there were eight cysts of the mesentery and one large one in the liver, also one adherent to the prostate which could not be extirpated.

PERITONEUM.

Peritonitis.—A. V. L. Brokaw, of St. Louis, Mo., $^{364}_{\text{Jan.1}}$; $^{202}_{\text{Jan.25}}$ in writing of this form of inflammation from a surgical stand-point, suggests the following classification: (1) traumatic peritonitis (developing after accidental traumata or surgical operations); (2) peritonitis due to ulcerative perforation of abdominal or pelvic vis-

cera (appendix, intestines, stomach, Fallopian tubes, gall-bladder, bladder); (3) peritonitis due to incarcerated hernia and intestinal obstruction; (4) peritonitis due to rupture of intra-abdominal abscesses or tumors (ovarian or other cystic tumors); (5) puerperal peritonitis; (6) peritonitis from obscure and undetermined causes; (7) localized peritonitis; (8) tubercular peritonitis. He also records a number of cases.

Greiffenhagen [21 Apr.25] reports an interesting case of traumatic purulent peritonitis in a girl aged 9. Four days after the injury (a kick) she came under treatment, with well-marked symptoms. Six days later she was attacked with labial noma, which yielded to appropriate treatment. On the sixteenth day aspiration was performed, and again on the 22d; pus in large quantity was drawn off. It was not until the fifty-second day that a resort was had to abdominal section; adhesions were found everywhere, and the whole peritoneum was covered with pyogenic membrane. Nevertheless, there was almost steady recovery; twenty-three days after the laparotomy a plastic operation was performed to repair the damage to the mouth, and thirty-two days later the patient was discharged cured. The whole duration of the treatment was one hundred and three days, and a year afterward the child was seen in perfect health.

Liermann [69 Feb.25; 2 Mar.19] says that the peritonitis following upon perforation of a gastric ulcer may occasionally be circumscribed, and that this is especially the case when adhesions have been previously formed. He relates four cases of such circumscribed abscess. W. Winslow Hall [2 Jan.9] has only been able to find the records of six cases in which recovery was established after peritonitis had been set up by a perforating gastric ulcer. He details a case with every symptom of gastric perforation, which recovered without operation. Only clinical facts established the diagnosis. Jalaguier [336 Aug.18] operated successfully on a girl of 12, in whom purulent peritonitis developed after traumatic rupture of the cæcum.

Nélaton, of Paris, [3 Jan.16] reports a case of pseudo-intestinal obstruction from plastic peritonitis. The patient, a young woman aged 28, had symptoms similar to those found in appendicitis. Primary rectal examination revealed nothing, and medical treatment only was adopted. Under this she rapidly improved; but again the patient's condition became more serious, and upon con-

sultation it was decided that an operation should be performed. The decision to operate was based mainly on the discovery, by both rectal and vaginal examination, of a large mass in the posterior *cul-de-sac*, which appeared to be attached to the uterus. It was supposed to be a hæmatocele. Upon operation (through the vagina), the uterus was found retroflexed, and neither a hæmatocele nor purulent pockets were found; simply strong adhesions, which bound the posterior wall of the retroflexed uterus to the rectum. The patient recovered rapidly, quitting the hospital in fifteen days. Examination of the uterine annexes, under chloroform, revealed nothing abnormal. This case is chiefly remarkable because it shows that pseudo-obstruction can exist from simple plastic peritonitis.

Körte, of Berlin, $^{336}_{\text{Aug.13}}$ has operated on nineteen cases of purulent peritonitis, ranging in age from $2\frac{1}{2}$ to 71 years. Six of these cases are still alive. One of them has a small intestinal fistula. He believes the most favorable age for operation is between 18 and 31. Wyder, of Zürich, $^{214}_{\text{Dec.1,'91}}$ reports two cases of Schwyzer's treated by operation. One was caused by rupture of the uterus in a woman who had had seven children. The other developed puerperal fever after the birth of twins. After laparotomy a suppurating ovarian cyst was removed and the abdominal cavity flushed with warm salicylic-acid solution (1 per cent.). Both cases made a good recovery. Kaufmann, $^{214}_{\text{Dec.1,'91}}$ in the discussion which followed, gave three contra-indications for laparotomy in peritonitis: (1) general obesity; (2) anæmia of long standing from hæmorrhage; (3) acute ptomaïne-poisoning from incarcerated bowel. Zerner, of Vienna, $^{57}_{\text{Jan.24}}$ recommends laparotomy and flushing of the abdominal cavity with a salicylic-acid solution, for purulent peritonitis.

A. E. Routier $^{3}_{\text{Jan.20}}$ operated on a boy of 15 years, for general purulent peritonitis due to perforation. The symptoms developed rapidly and were very severe. An incision was made into the iliac fossa, and a large quantity of greenish, creamy pus escaped. No attempt was made to find the perforation, on account of the weak condition of the patient. The wound was left open and drained by strips of iodoform gauze, after the abdominal cavity had been thoroughly flushed out with a solution of naphthalin. Eversen, of Copenhagen, $^{370}_{\text{No.8}}$ has performed laparotomy in seventeen cases of

purulent peritonitis. In four of these cases a partial vaginal hysterectomy was performed in order to secure free drainage for the pus, and thus avoid the danger of opening the peritoneal cavity. Fontanilla, of Havana, [773 Mar.20] reports at some length the case of a man of 49 years, who was operated on by Menocal for local suppurating peritonitis. After the presence of pus had been demonstrated by an exploratory puncture, a laparotomy was performed. The abdominal cavity was washed out with Van Swieten's solution, and closed with silver wire. Drainage was employed, and the patient made an excellent recovery.

F. A. Southam, [90 July] records a case of acute suppurative peritonitis, in a man of 30, apparently of idiopathic origin. Symptoms of intestinal obstruction were produced by the peritonitis. Abdominal section and drainage resulted in recovery. In this article T. N. Kelynack contributes an analysis of one hundred and twenty-four cases of acute peritonitis, taken from the records of two thousand eight hundred and fifty-five post-mortem examinations.

F. Marsh, at a meeting of the Birmingham and Midland Medical Society, [2 Apr.30] showed specimens, removed from a girl of 5, where the symptoms of intestinal obstruction were due to plastic peritonitis caused by a suppurating mesenteric gland.

William S. Cheesman, of Auburn, N. Y., [59 Sept.10] performed ovariotomy in the presence of peritonitis, in a girl of 27, for the rupture of a large abdominal cyst. After opening the abdominal cavity adhesions were found everywhere. They were mostly recent and could be easily broken by the fingers, but in the true pelvis they had become quite firm and some force had to be used to break them up.

The following writers have contributed articles on the surgical treatment of peritonitis: Gérard, [3 Aug. 31] X. O. Werder, Pittsburgh, Pa. [161 Nov.,Dec.,'91; 138 Feb.]; A. Rabagliati, [22 Feb.24] A. H. Cordier, of McPherson, Kansas [198 Mar.]; J. F. W. Ross, [224 Dec.5.'91] T. F. Prewitt, of St. Louis. [364 Sept.1,'91]

Tubercular Peritonitis.—Hartman and Alibert [48 v.37,June; 118 June; 80 Aug.] have reviewed the literature of tubercular peritonitis in children treated by laparotomy. Since 1887 many operations have been performed, 48 of which have been collected by these authors. Three cases occurred in their own practice, and in 2 of them the bacillary nature of the effusion was established by inoculations. Of the 48 cases, 46 were cured and 2 died. Some of those considered cured

were not subsequently seen. Richelot, of Paris, $^{3}_{\text{Apr.20}}$ at a meeting of the Surgical Society of Paris, communicated 4 cases treated by laparotomy. Two of the patients have continued to do well. One of them was especially interesting; a woman of 22 years, operated on in June of 1890, returned in the month of October and was operated on a second time. The granulations then were so large that carcinoma was suspected. A year later she was operated on for the radical cure of an enormous hernia. All the lesions previously witnessed had disappeared.

A. Vander Veer, of Albany, New York, $^{81}_{\text{Oct.,'91}}$ communicates four cases, and advises early operation, before the tubercular diathesis has become established. Lejars $^{100}_{\text{Dec.3,'91}}$ writes of intestinal obstruction in the course of tubercular peritonitis. Mangin $^{46}_{\text{Jan.1}}$ considers laparotomy for tubercular ascites. J. B. Deaver, of Philadelphia, after considering the different varieties of tubercular diseases of the peritoneum and the causes of the same, details the histories of four cases. Three recovered, although one of these, a boy of 7 years, has since failed progressively. A. W. Mayo Robson $^{2}_{\text{Mar.19}}$ reports three cases which illustrate the curative effect of abdominal section and drainage for this affection. E. Schwartz $^{3}_{\text{Jan.20}}$ also reports two successful cases.

Theodore A. Magraw $^{846}_{\text{Dec.,'91}}$ writes upon the treatment of chronic abdominal dropsies by incision and drainage. He thinks it is probable that the curative effect of incision upon these collections is due to the establishment of free drainage. He records the case of a boy of 14 years, with chronic abdominal dropsy following some obscure disease of the liver and spleen, whose cure was effected by operation.

Alexandroff $^{118}_{\text{Sept.,'91}}$ reports a case of tubercular peritonitis of the ascitic form. Laparotomy was performed, without irrigation; drainage only. In three weeks the fluid had re-accumulated. The second operation, with irrigation with boracic-acid solution, resulted in complete recovery.

Aldibert, of Paris, $^{126}_{\text{July 15}}$ in a study of laparotomy in tubercular peritonitis (especially that of children), sums up his conclusions as follows: In the form with ascites, laparotomy gives better results upon the child than upon the adult; and successful cases are more numerous when they assume a form less acute and more localized. Intervention should be attempted in the acute forms, in spite of

the deplorable results observed up to this time; in the subacute forms, if the operation is but curative in half the adult cases (four-fifths of children recover), it always produces a notable improvement. In all the chronic forms it gives better results than those which follow medical treatment. Dry fibrous peritonitis shows itself in two forms, according to the presence or absence of adhesions. In the first form the affection is changeable, and can become ulcerative; laparotomy is always indicated. In the adhesive form, the form of spontaneous recovery, it is not necessary to operate when painful symptoms exist,—a rapid aggravation of the general condition, or the signs of chronic (occlusion) obstruction. In these cases laparotomy has given 100 per cent. recoveries upon children (60 per cent. appear to be complete) and 68.4 per cent. upon adults (of which 37.7 per cent. appear to have been complete). Laparotomy, in the dry, ulcerative form, gives very mediocre results (mortality of 75 per cent.); it is again useless in the suppurative forms, encysted in sacs; the operation furnishes more successes in the localized suppurative forms, especially peri-umbilical, than in the general form.

Lindner, of Berlin, [301 B.24,p.448] has collected 205 cases of peritoneal tuberculosis which were operated upon, and makes the following deductions: Of the 205 cases, 15 (or 7.5 per cent.) died; only a few of these from peritonitis or sepsis, the most from collapse after long operations. Among 186 patients, of whom the sex was given, 11.3 per cent. were men. In women, the genital organs were most commonly the avenues of infection. The number of fatal cases among men was greater than among women. The best prognosis is to be given in encapsulated cases, and in those with much exudate. The most important factor in resorption is that the serosa should be intact. Andrea Ceccherelli, of Parma, [589 Aug.11,12] reports eight cases of tubercular peritonitis upon which he operated. All were benefited.

Poppert, of Giessen, Germany, [34 Aug.23] reports the history of a girl of 11 years, who suffered from intussusception due to tubercular peritonitis. After laparotomy, a loop of small intestine was found firmly bound to the abdominal walls by the bands of lymph which occluded the gut. An artificial anus was established at this point, and permanently closed at the end of fifty days. No miliary tubercles were seen. Ultimately (after eleven months)

the patient made a complete recovery. Lindner, [69 Feb.11] and T. J. Crofford, of Memphis, Tenn., [849 June] also report cases of equal success. Lanphear, of Kansas City, Mo., [364 June 15] impressed by the favorable statistics of König, of Göttingen (65 per cent. of recoveries after operation among one hundred and thirty-one cases), urges the practical usefulness of laparotomy.

Zambler, of Padua, [594 Dec.,'91; 41 Aug.18] has made a series of investigations upon washing out the abdominal cavity in the cadaver to ascertain how this could be accomplished most thoroughly. He found it was not possible to remove all the products of inflammation by flushing. He reports seven cases of tubercular peritonitis on which he performed laparotomy. The ages were between 10 and 41. After operation two died from other tubercular lesions,—one three and one-half months, the other four months after the operation. Three cases were seen a few months after the operation, and were in an improved condition. Another was apparently cured six months ago; but the present condition is not known. In the seventh case the ascites returned three months after operation.

Foreign Bodies in the Abdominal Cavity.—Pilate, of Orleans, [24 June 12] reports five interesting cases: Case I. A piece of gauze, twenty-six centimetres, remained in the abdomen after laparotomy, and was expelled by the rectum eight months later. Case II. Quénu allowed a gauze compress to remain in abdomen. At the autopsy, four days after the operation, it was found wound around the intestine. Case III. Terrier lost a sponge, which was recovered three days later at the autopsy. Case IV. Terrier has reported a case under the care of another surgeon who missed a pair of hæmostatic forceps at an abdominal operation. They were recovered, after eight months, through the patient's umbilicus. Case V. Michaud operated on a woman for a small tumor on the anterior abdominal wall which proved to be thirty-five centimetres of iodoform gauze within the intestine. After resection of the gut recovery resulted. In two other similar cases the loss was discovered soon after the operation, and in the one case a sponge and in the other a pair of forceps recovered. W. Gill Wylie, of New York, [59 May 7] removed a glass rod, six and one-half inches in length, from the peritoneal cavity of an unmarried woman aged 25. She had introduced the rod herself to bring on a miscarriage,

and it worked its way through the uterus just posterior to the junction of the left tube with the fundus. Its presence in the abdominal cavity caused constant pain. After its removal she made an excellent recovery. Richard Wilson, of Philadelphia, [9 Jan.17,'91] after reporting a case in which a large flat sponge remained in the abdominal cavity four days, briefly reviews the important facts of thirty somewhat similar cases.

INTESTINES.

Anastomosis.—Robert Abbe, of New York, [22 Aug.24] considers the following as representing the perfect technique of suturing: "Bring the two surfaces that it is proposed to unite well up in the wound, and surround them by small compresses of gauze or towels or flat sponges wrung out of hot water. Have at hand a half-dozen fine cambric needles threaded with ordinary finest black embroidery silk that has been well boiled and kept in alcohol. Cut in lengths of not more than twenty-four inches and tie with a single knot at the eye of the needle, with one end cut to within two inches. Apply two parallel rows of continuous Lembert sutures, a quarter of an inch apart, and an inch longer than the proposed cut. Leave each thread with its needle attached at the end of its row. Now open the bowel by scissors, cutting a quarter of an inch from the sutures, both rows of which are to remain on one side of the cut. Make the bowel-opening four inches long. Apply clamps temporarily to several bleeding points, pinching the entire thickness of the cut edge without hesitation. Apply no ligatures. Treat the opposing bowel in the same manner. The clamps remaining *in situ*, the parts are quickly rinsed with water. Another silk suture is now started at one corner of the openings and unites by a quick overhand the two cut edges lying next the first rows of sutures. The needle pierces both mucous and serous coats, and thus secures the bleeding vessels, from which the clamps are removed as the needle reaches them. This suturing is then continued round each free edge in turn, and all bleeding points are thus secured more quickly than by ligature. The serous surfaces around these button-holes are then rapidly secured by a continuation of the sutures first applied, the same threads being used, the one nearest the cut edge first. The united parts are again rinsed with water and dropped into the abdomen."

In conclusion, he reiterates his conviction: (1) "that the attempt to simplify the technique of lateral anastomosis by bone plates and other devices has not improved it; (2) that lateral anastomosis, properly done, is eminently the safest and best method of restoring the canal in most cases; (3) that simple and thorough suturing with a fine silk continuous suture, applied after the

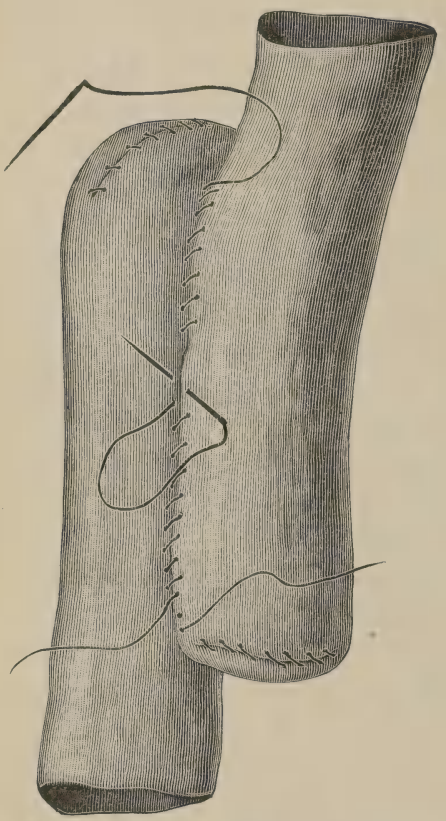


FIG. 1.—SUTURING INTESTINES IN APPOSITION BEFORE INCISION.

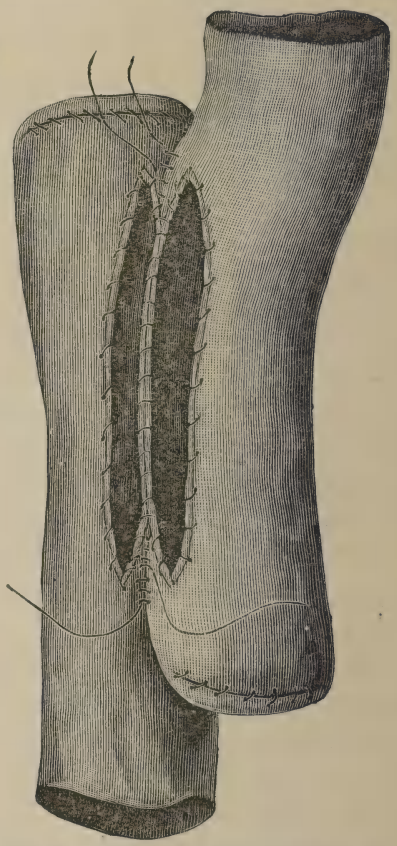


FIG. 2.—AFTER FOUR-INCH INCISION AND SEWING THE EDGES.

(*Medical Press and Circular.*)

manner detailed, is most satisfactory; (4) that in order to allow for the inevitable tendency to stenosis an aperture four inches long should be made between bowels; (5) that scarifying opposing surfaces is entirely unnecessary to quick and solid repair."

He also reports six cases of intestinal suture and one in which catgut rings were used in making the anastomosis. This latter

was the only fatal case. Kammerer, of New York, $\frac{1}{\text{Sept. 3}}$ reported a successful case of anastomosis by Abbe's method. The patient died four months after operation from extensive pelvic caries. The specimen showed an anastomosis two and one-half inches in length, the openings having scarcely contracted at all.

H. W. Maunsell $\frac{6}{\text{Feb. 15}}$ describes an operation for end-to-end anastomosis, invented and used by him ten years ago. The portion of gut to be operated upon is clamped off by passing stout safety-pins through the mesentery about the gut, and compressing it by means of sponges placed between the pins and the intestine on either side, the pressure varying with the amount of sponge inserted. The portion of gut is then resected. Two temporary sutures are used to unite the ends: one placed at the mesenteric juncture, the other diametrically opposite. An incision is made in the gut opposite to the mesenteric attachment, through all the coats, beginning an inch to an inch and one-half from the cut end, a little over an inch in length. The temporary sutures are passed through this, the gut ends invaginated and brought through this opening, the temporary sutures holding them in place, while they are united by interrupted sutures that take in all the coats and are placed one-quarter of an inch from the cut end. The gut is then drawn back and the

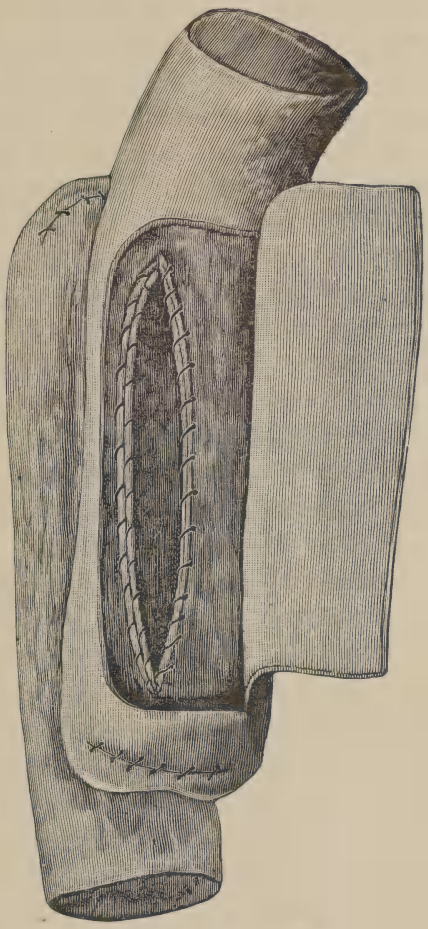


FIG. 3.—COMPLETE ANASTOMOSIS (WINDOW CUT OUT TO SHOW INTERIOR).
(*Medical Press and Circular.*)

longitudinal wound is closed by a Lembert suture. The mesentery is united by one or two interrupted sutures. This method has given very satisfactory results.

M. L. Harris, $^{1052}_{\text{Sept.}}$ of Chicago, describes a new method of circular enterorrhaphy. The operation consists in denuding the submucosa of its mucous coat for a distance of one-half to three-fourths inch from the distal end of the gut, and invaginating into this the proximal end, and thus securing union between the submucosa of the one and the serous surface of the other. There is no mechanical device employed, leakage being prevented and coaptation secured by means of two sets of running sutures.

J. D. S. Davis, of Birmingham, Ala., $^{647}_{\text{July}}$ describes a "circulo-lateral enterorrhaphy." The ends are approximated by means of looped stitches, beginning on either side of the mesentery. At their point of meeting, opposite the insertion of the mesentery, an incision is made in the longitudinal axis of the gut, sufficient to counteract any stenosis that might be produced, enlarging the calibre of the gut by suturing in a transverse direction the edges of the longitudinal incision, the union being made between the edges of the longitudinal incisions in the proximal and distal ends of the intestine.

M. E. Connell, of Milwaukee, $^{59}_{\text{Sept.17}}$ describes a method of suturing requiring but two or even one knot, and claims for it simplicity and celerity in execution. Jaboulay, of Lyons, $^{211}_{\text{Nov.29,'91}}$ reports three cases of intestinal resection with the use of Gussenbauer's sutures. In one case return to an artificial anus was necessitated by the persistence of the obstruction. The second recovered fully after the removal of two sections, of two and eight centimetres respectively. The third died, after operative recovery, from intercurrent gangrene of the lung. The autopsy showed the intestines perfectly healed.

Routier $^{3}_{\text{Jan.16}}$ reports a case of Larabrie's, of Nantes, where abscesses in the abdominal sutures, in a case of laparotomy, formed a fistulous opening into a loop of intestine. Another loop being adherent, an anastomosis was formed between them, thirty Lembert sutures being used. Abdominal cavity was flushed with boiled water before closing. Recovery.

Frank $^{57}_{\text{May 29}}$ showed a patient, a woman aged 25, on whom he had performed resection of the intestine (after Hochenegg's

method) for multiple tubercular stricture of the intestine. Recovery. F. Hartley, of New York, $^{1}_{\text{Sept.10}}$ reports a rapid recovery after resection for intussusception and carcinoma. The enterorrhaphy was by Maunsell's method. R. F. Weir, of New York, $^{59}_{\text{Apr.9}}$ made an anastomosis between the lower portion of the ileum and the sigmoid flexure by lateral anastomosis with four-inch incision. He used no plates, but a double row of Lembert sutures, and stitched the edges of the opposed wounds together at the ends. Recovery was rapid and complete.

Angelo Mazzucchelli, of Pavia, Italy, $^{505}_{\text{No.89,p.708,'90}}$; $^{19}_{\text{June 25}}$ reports a successful case of enterorrhaphy by the use of Czerny's sutures. J. H. M. McCartney $^{235}_{\text{Dec.,'91}}$ reports a death after enterotomy in a child 3 months old, after an attempt to close a wound made by a Chinese doctor. J. M. Barton $^{104}_{\text{July 7}}$ exhibited a patient, five years after operation, on whom he performed an enterectomy for an obstructive epithelioma; there had been no recurrence of the disease. He formed an artificial anus, and at the same operation applied Dupuytren's enterotome, cutting through nine inches of the spur in three successive applications. The patient had a small fæcal fistula remaining, but had regular, natural stools as well.

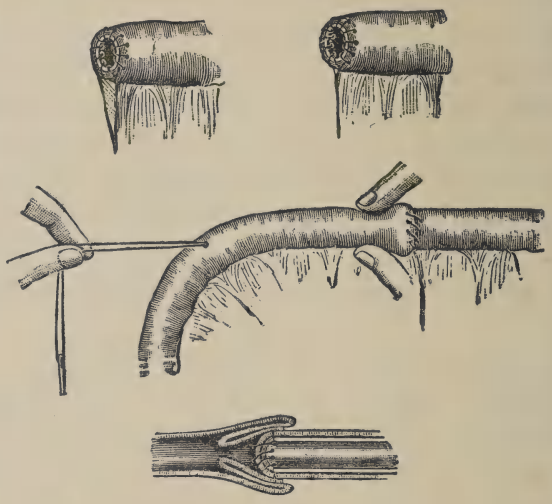
Chaput $^{7}_{\text{June 10}}$ recommends lateral anastomosis by a modified Lembert suture, circular enterorrhaphy by Czerny-Lembert sutures, and a method which he claims overcomes the difficulties of stricture and the union of guts of different calibre, requires fewer stitches, and is quicker. The end of one gut is applied to the side of the other and sewed there, the end of the latter being then invaginated and closed.

Braun, of Königsberg, $^{336}_{\text{Aug.13}}$ recommends entero-anastomosis in preference to circular intestinal suture in the following cases: (1) where the intestinal laminæ to be united are very different in size; (2) in very narrow intestines, as in children; (3) in resection of the lower part of the ileum; (4) in adhesions of the bowel, as in fæcal fistula. The operation is easier, and can be done quicker than circular suture. H. K. Hofmokl $^{57}_{\text{May 29}}$ showed a specimen of resected intestine from a patient on whom he had done laparotomy for intussusception of the ascending with the transverse colon associated with submucous lipoma (which filled the entire lumen of the intestine for several inches). Death ensued. Stifler, of

Bad Steben, $^{34}_{\text{Mar.22}}$ reports a successful case of intestinal resection for gangrene following incarcerated femoral hernia.

F. T. Paul, of Liverpool, $^{187}_{\text{July}}$; $^{2}_{\text{Apr.9,16,May 21}}$ has devised a new method of invagination in end-to-end anastomosis. It consists in the use of a decalcified bone drainage-tube which is sewn into the proximal end of the gut. This is passed, by means of a temporary suture into the distal end, producing an invagination. Lembert sutures are then applied at the exterior point of juncture. (See cuts.)

F. B. Jessett $^{2}_{\text{Apr.2}}$ thinks that he obtains better results, though similar, and with more ease and rapidity, by using two decalcified tubes, a "male" and "female," made to fit one within the other



CIRCULAR ENTERORRHAPHY.
(*Liverpool Med.-Chir. Journal.*)

and fastened together, after being inserted into the gut, by four sutures passed from the tubes outward through the walls. The invagination is then produced and the exterior line of juncture sutured. Both of these methods are open to the arguments so fatal to all mechanical contrivances, and also to the objection of producing a condition like that of a pathological intussusception.

R. H. M. Dawbarn, of New York,[2161] advocates a vegetable plate made of potato, believing it to be an emergency method, rapid in procedure and always available.

F. Reder, of Hannibal, Mo., $^{101}_{\text{Sept.}}$ has invented a rubber bulb to aid in facilitating end-to-end suture. It fits into the proximal

and distal ends, holding them during suture. H. H. Grant, of Louisville, [96 Feb.] advises Robinson's rawhide plates in anastomosis. W. E. Ashton, of Philadelphia, [19 Apr.] reports a successful case of lateral anastomosis by means of rubber sectional rings of his own invention, so arranged as to keep open the lumen of the incisions. Barling [2 Apr.30] reports a case in which he used Senn's method. The patient passed a solid stool on the fourth day, but died on the sixth from a suppuration due to gangrene from loss of blood-supply, caused by ligature of mesenteric blood-vessels. The autopsy showed good and perfect union and both plates much absorbed. Milton [6 Sept.24] reports a successful enterorrhaphy, a gelatin tube two inches long being used to hold the ends in position.

K. Maydl [84 No.20; 80 July 15] describes a new method for performing jejunostomy. The small intestine is cut through transversely, fifteen to twenty centimetres, from the plica duodeno-jejunalis. Both ends are drawn out and the peritoneal wound closed by provisional sutures. An incision of about three centimetres is then made in the lower portion of the bowel, ten centimetres below the opening of the " peripheral " end, in the convex side of the long axis, and the " cerebral " end is then sewn into the lower portion of the united intestine. By this means the secretions of the pancreas and liver can flow uninterruptedly into the bowel. The two cases operated on (women aged 40 years) recovered.

Von Hacker, of Vienna, [57 Dec.20,'91] reviews the operations for intestinal anastomosis (in man and animals) since 1887. He mentions fifteen cases (with lateral apposition), three of which (very unfavorable cases) died and twelve recovered. He recommends the operation with lateral apposition (leaving the extirpated piece *in situ*) in cases of disseminated stenosis, or in operable carcinoma where one must operate in great haste; also in penetrating wounds of neighboring intestinal coils, in certain cases of fæcal fistula, artificial anus, and certain forms of intestinal obstruction (invagination, hernia, etc.). On the contrary, he recommends Hochenegg's method in cases of stenosis of an inflammatory nature.

Experiments.—Micheli and de Sanctio, [589 p.153] after a series of operations of ileo-coloplasty on dogs, conclude that (1) it is possible for a part of the small intestine to live when transplanted between two ends of the colon; (2) the same can replace a part of the colon; (3) in this way it is possible to restore the circulation in the

colon, although the ends of the same are not approximated; (4) the animals can live a long time after operation with no unpleasant sequelæ. They recommend the operation (1) in all cases of stenosis of the colon requiring an extensive resection; (2) in tubercular processes which have spread over a considerable part of the colon; (3) in all malignant tumors which affect a large tract of long intestine. Spalletta, of Palermo, $^{589}_{\text{June 30}}$ has performed a number of experiments on dogs for intestinal anastomosis, using decalcified bone plates made from the human femur and humerus. This modification in technique was suggested to him by Marcacci. He also used rings of rubber with equal success. A month and a half after the operation, when the dogs were killed, excellent union had resulted. The lumen of the intestines was not decreased to any appreciable extent.

Injuries of the Intestines.—W. B. Coley, $^{151}_{\text{Apr.}}$ in speaking of penetrating gunshot wounds of the abdomen, says (1) that exploratory incision should be made in the region of the wound to ascertain whether or not it be penetrating; (2) if penetrating, median laparotomy should be performed as soon as possible after the injury (unless contra-indicated by severe shock); (3) signs of peritonitis, just beginning or well developed, while diminishing the chances of success, are by no means a contra-indication for operative interference.

Edouard Adler $^{212}_{\text{Sept.25}}$ furnishes the following statistics: Laparotomies for gunshot wounds of abdomen,—70 recoveries, 84 deaths; mortality, 54.5 per cent. Operation five hours after traumatism,—26 recoveries, 27 deaths; mortality, 52.7 per cent. Operation ten hours after traumatism,—6 recoveries, 18 deaths; mortality, 74 per cent. Operation twenty hours after traumatism,—7 recoveries, 19 deaths; mortality, 73.9 per cent. Operation still later after traumatism,—5 recoveries, 18 deaths; mortality, 78.2 per cent. Deductions: Hæmorrhage kills early, if at all; peritonitis should not be charged to operation. Among the cases of stab wound of the abdomen there were 37 recoveries and 12 deaths. He also records a number of other cases of laceration of the bladder and contusion of the abdomen. Charles Arnat $^{55}_{\text{Nos.11–16}}$ has contributed a series of elaborate essays upon the treatment of traumatic lesions in this locality from projectiles of small calibre. He concludes that routine treatment should be avoided, as there are many circum-

stances to be considered in each case. Most important among these are (1) the character and rapidity of the projectile and (2) the symptoms and condition of the patient. D. D. Crowley, of Oakland, Cal., $\frac{147}{\text{Jan.}}$ writes of the diagnosis of wounds of the intestine by hydrogen-gas, with a new method of locating the wound after opening the abdomen.

Dawbarn $\frac{1}{\text{Mar. 12}}$ finds several practical objections to Senn's hydrogen-gas test. Although he has never had an opportunity to use this test upon the living subject, he has tried it twenty-two times upon the cadaver. Berger, of Montreal, $\frac{221}{\text{Mar.}}$ advises laparotomy in penetrating wounds of the abdomen, if seen early; but, if seen twelve hours afterward, it is wiser to await urgent symptoms. Wounds of the stomach and large intestine are less dangerous than those of the small intestine. He reports two recoveries without operative interference after revolver wounds of the stomach, as also one of the large intestine; one case of stab wound of the transverse colon, intestine sutured, recovery; one stab and five revolver wounds of small intestine, with five deaths.

Seliger[88] found, according to his statistics on the subject, that gunshot wounds of the front of the abdomen were four times more frequent than those of the back, and have a mortality of 54 per cent.; if complicated by injuries of the bones, 78 per cent. In cases where the pleural cavity was perforated death always resulted, even if the lung escaped injury. In the fatal cases death occurred within the first two weeks, and was attributable to hæmorrhage, peritonitis, or septicæmia. It may happen that the bullet perforates the abdominal cavity without injuring the intestine; but usually protrusion of the gut occurs, rendering the prognosis worse. Gunshot wounds of the omentum may terminate fatally from hæmorrhage, but otherwise the prognosis is good. Wounds of the stomach are usually fatal, and the same applies to wounds of the duodenum. A cure in cases of gunshot wounds of the small intestine is very rare, while, among wounds of the large intestine, those of the descending colon and sigmoid flexure are seldom fatal; those of the transverse colon give a worse prognosis. Recovery in these cases is rendered tedious by the formation of fistulæ, adhesions, and abnormal communications, especially when the rectum is involved. A marked contrast exists between intra- and extra- peritoneal wounds of the bladder, the former

being uniformly fatal, while the latter give a mortality of only 15 per cent. Gunshot wounds of the kidney are attended with a death-rate of 44 per cent., but, even in favorable cases, persistent renal fistulæ and chronic inflammation of the parenchyma are frequently left behind. In gunshot wounds of the liver the mortality is 26.8 per cent. The most frequent sequelæ are biliary fistulæ, although abscesses have been noted. Wounds of the spleen are difficult to diagnose, and the mortality in this class of cases amounts to 65 per cent. Wounds of the substance of the spinal cord in the lumbar region result fatally, but a more favorable prognosis can be given in cases of effusion of blood into the spinal canal. The mortality of wounds of the pelvic bones is also very high, death often occurring at a late period from exhaustion or amyloid degeneration resulting from protracted suppuration.

Chaput, $^{3}_{\text{p.436,'91}}$ in extensive experiments upon dogs in cases of penetrating wounds of abdomen, discovered that 100 per cent. of recoveries could be procured if the operator closed the punctured gut by means of sutures to the side of a healthy loop. If the perforation is double, place another loop upon the other side. Union is rapid, firm, and secure. The omentum also adheres very rapidly, two hours being sufficient to obliterate a puncture. Operate within the first four hours if possible.

Klemm, of Riga, $^{301}_{\text{B.33,H.2,3}}$ from an experimental study of gunshot wounds of the abdomen, concludes that the extent of the lesion of the intestine depends upon the angle at which the ball strikes it. In small wounds of the bowel, he has found that the mucous membrane pouts out and closes the orifice; but as soon as peristalsis occurs it is drawn in, and there may be an escape of a small fæcal mass. When this takes place repeatedly, a large amount of fæcal matter will be extruded, even through a small opening. The author favors the early performance of abdominal section; since to wait for the first symptoms of peritonitis would be to wait until septic poisoning has made the outlook from operation nearly hopeless. Poroschin, $^{21}_{\text{May 23}}$ on the other hand, describes a case in which a bullet entered the abdomen, wounding the stomach and the kidney; the patient recovered under expectant treatment. From this and many other recorded instances, Poroschin advocates this plan as proper in cases of shot wounds of the abdominal vis-

cera, except when there is intra-peritoneal bleeding, or escape of gas or intestinal contents from the wound, or if peritonitis is commencing.

Reclus [221 Mar.] reports the spontaneous forming of an artificial anus after a penetrating revolver wound of the abdomen; also a case of recovery without operative intervention. Experimentally, he has determined (1) that gastric juices tend to become encysted in the peritoneal cavity, while intestinal juices cause inflammation; (2) the mucous coat of the small intestine spontaneously closes the punctures and prevents escape of their contents; (3) shock is often from hæmorrhage, and is, therefore, not a contra-indication to operation; (4) he advises that intestinal herniæ should be replaced after cleansing; (5) immediate intervention is not recommended. The following writers have also contributed articles on traumatism of the abdomen: P. Michaux [3 Feb.3]; J. J. Norton, of Monroe City, Mo. [65 Dec.,'91]; Villeneuve, of Marseilles [46 Aug.15]; M. L. Heflefinger, of Texas [85 Feb.]; E. M. Robinson, of Bessemer, Ala. [12 June; 59 Aug.13]

Langenbuch [69 Apr.28] showed a young man who, some time previously, had been severely wounded in the abdomen by a wagon-pole. The intestines were much contused and very dirty. In some places the serosa and muscular coats were torn through. The intestines and peritoneal cavity were carefully cleansed with a solution of iodine terchloride (1–1000) and the wounds united. The patient recovered without any fever. Adler, of Berlin, [69 Jan.14] reports a case of stab wound in which the diaphragm had been opened and the right pleural cavity entered. There was also a wound of the liver one and a half centimetres long. The latter was closed, with continuous silk sutures passed deep into the tissue and overlapping, completely controlling the hæmorrhage there. The diaphragm was also closed, leaving an iodoform-gauze drain. The peritoneum alone was sewed at this time. The patient improved constantly, and at the end of fourteen days, after freshening the edges, the skin surfaces were sewed together. He left the hospital completely cured.

Kottmann [214 Dec.1,'91] reports two cases of laparotomy. One was for a penetrating wound of the intestines in a young man, with escape of fæces into the abdominal cavity; the other for acute peritonitis following an operation for strangulated hernia. Both recovered. Appenzeller [133 No.11] reports the case of a boy of 13, who

had been tossed by a bull. The wound was six centimetres long. A mass of intestinal convolutions protruded; this was washed in 3-per-cent. carbolic solution and returned, the wound being closed with iodoform gauze. Although the intestines had remained exposed over three hours, recovery ensued.

Archelaschi [497 May] has put on record a number of cases as follows: Case I. A revolver-ball of large calibre traversed the abdominal cavity through the left lumbar into the sacral region. There was considerable shock resulting, but under expectant treatment the patient was discharged cured in fifteen days. Case II. Stab wound of the abdomen, with escape of intestines; laparotomy; death in forty-eight hours. An autopsy showed no perforation of the intestines. Case III. Stab wound of the abdomen; laparotomy; recovery. Case IV. Stab wound of the abdomen; extrusion of a portion of the omentum, which was excised. Nothing further was done, and recovery resulted. Case V. Stab wound penetrating the stomach; death in twenty-six hours from loss of blood.

The writer believes that immediate laparotomy is called for if the intestines be wounded, if the peritoneum has become involved, or if there be hæmorrhage. If none of these conditions be present, he believes it is wiser to wait.

Zimmer [761 B 8,H.3] has observed two cases of gunshot wound, in one of which death resulted, a few days after operation, from rupture of the spleen. The following writers contribute cases which resulted favorably after operation: Macris [232 Feb.15]; Fontan, of Toulon [3 Feb.17]; E. F. Beucking, of Chicago [192 Jan.]; M. J. Ahern, of Quebec [122 June]; Appenzeller, of Reutlingen [133 Apr.30]; Tipjakoff [336 July 30]; F. L. Brewer [786 July]; A. A. Smith, of Hawkinsville, Ga. [19 May 14]; F. C. Johnson, of Richland, Ga. [207 Aug.]; F. A. Simmons, St. Joseph, Mo. [72 Jan.]; H. C. Dalton, of St. Louis [96 Dec.,'91]; Sewaki, of Tokio [200 Nov.23.,'91]; Puzey [6 May 28]; W. H. Patterson, of Reno, Nev. [147 Mar.]; Andrew Ross [6 Dec.12,'91]; Morf. [34 No.23]

The following writers record cases which terminated fatally after operation on account of the character of the wound inflicted: Zucarelli [46 Apr.15]; Routier and Peyrot [221 Mar.]; Hermes [336 No.16]; Rockwell [1 No.21,'91]; A. S. Priddy, of Keysville, Va. [81 Dec.,'91]; L. S. Taylor, of Chicago [192]; T. N. Kelynack. [90 July; 6 Aug.20]

F. P. Lippincott, of Philadelphia, [112 Sept.] has brought together some valuable statistics in favor of a conservative course of treatment in

these injuries. His conclusions are as follow: (1) In about 90 per cent. of the penetrating wounds of the abdomen, the viscera are involved; (2) in the majority of cases of abdominal gunshot wounds the intestinal lesions are multiple; (3) When the viscera are wounded, fæces and gas, or finding the ball in the evacuations, are the only pathognomonic symptoms; (4) nature is capable of effecting complete repair in wounds of the viscera by prolapse of mucous membrane, exudation of plastic lymph, bringing a healthy surface over the rent in gut, and finally cicatrization; (5) statistics do not show a less mortality by the operative than they do by the conservative treatment; (6) wounds of the stomach and small intestine are more grave than those of the large intestine; (7) shock of itself is not a symptom of internal hæmorrhage; (8) the most common cause of death in gunshot wounds of the abdomen is septic peritonitis, although deaths from shock and hæmorrhage are not rare; (9) the use of hydrogen-gas by rectum as a means of diagnosis is not infallible; (10) statistics do not justify abdominal section, except in well-selected cases, and particularly where there is pronounced hæmorrhage; (11) so far laparotomy has increased the mortality of gunshot wounds of the abdomen; (12) it is necessary for localized peritonitis to occur in order to attach the wounded gut to some healthy peritoneal surface: (13) the indications for treatment are to promote reaction, control hæmorrhage by pressure or abdominal section, stimulate hypodermatically, nothing by mouth, feed by rectum until adhesions have perfectly formed.

Berger, $^{108}_{\text{No.22, 58}}$ An. Schildt, $^{6}_{\text{Jan.30}}$ Chouppe, $^{3}_{\text{Mar.2}}$ Cecil, of Louisville, $^{224}_{\text{Mar. 12}}$ report cases with very alarming symptoms, which recovered on a course of purely expectant treatment.

Intussusception.—Hutchinson says of the operative treatment of intussusception $^{806}_{\text{July;}}$ $^{2}_{\text{Aug.6}}$ that the rule of practice in the early stages should be invariably to try insufflation and injection, and it is only when these measures have failed that laparotomy ought to be thought of; they are not without risk, and must be tried with judgment and caution. There is no reason for preferring insufflation to the injection of water; for the latter he prefers hydrostatic pressure to the use of a syringe. In infants under 2 years of age laparotomy is so uniformly fatal that it should not be resorted to. Above that age, if injection has failed, a prompt resort to laparot-

omy should be recommended. It is desirable that this should be done early, before the serous surfaces have become adherent.

Braun, of Königsberg, $^{226}_{\text{p.164}}$; $^{101}_{\text{Apr.}}$ concludes from three observations that, if after the use of enemata of water and of air, massage of the intestines, and puncture with a fine needle, the intussusception does not yield rapidly, laparotomy should be immediately performed.

Aldibert $^{118}_{\text{Jan.}}$ reviews the treatment of intestinal invagination, especially as regards infants. He advocates an immediate laparotomy and reduction by fingers inserted into abdominal cavity, avoiding exposure of intestine unless necessary.

A. E. Barker, of London, $^{6}_{\text{Jan.9}}$ advises the following operation in cases of irreducible intussusception: At the point at which the intussuscipiens enters the intussusceptum he unites the two portions of the bowel by a continuous suture. Through a longitudinal incision, opposite the mesenteric attachment, he amputates the intussusceptum, suturing the stump with interrupted sutures, to control bleeding and hold the serous surfaces in contact. The longitudinal incision is then closed. Two cases operated on died; he believes the operation was too long delayed. F. B. Jessett, of London, $^{6}_{\text{Jan.23}}$ commenting on Barker's operation, says he has performed it in a similar manner, but advises the amputation of the intussusceptum *in situ*, and thinks the first suture is of little use and seldom required. He prefers chromic gut to silk for sutures.

Petroff $^{859}_{\text{No.14}}$; $^{2}_{\text{Aug.27}}$ advocates tapping the bowel in cases of intestinal obstruction due to coprostasis. Robinson $^{112}_{\text{Oct.}}$ warns against the danger of invagination after all intestinal operations. He advises the use of a rubber tube stitched into the gut, six to eight inches long and extending three-fourths of its length into the proximal portion, especially in circular enterorrhaphy. Köhler $^{309}_{\text{Jan.16}}$; $^{112}_{\text{May}}$ details three fatal cases of obstruction of the intestines in which laparotomy was performed. He concludes that it is impossible to operate too early, and advises against washing out the stomach, which only improves the subjective symptoms, and does not obviate the necessity of operating.

J. Nicolaysen, of Christiania, $^{2}_{\text{July 23}}$ reports a case of volvulus with internal strangulation by the adhesion of the vermiform appendix about the small intestine at the point of twisting. A laparotomy with amputation of the appendix was followed by recovery. Lindermann, $^{4}_{\text{June 27}}$; $^{2}_{\text{July 30}}$ after reviewing statistics, says that

only twelve cases out of sixty-six could be saved by operation in intussusception, and attributes death, which usually follows in about sixteen hours, to the force required and applied to the gut in relieving the obstruction, and the consequent shock. W. Körte [69 June 8] records a case of recovery from intussusception in an 8-year-old child after laparotomy and disinvagination by gentle traction. There was no gangrene; circulation and peristalsis returned.

P. Bonazzi [594 Jan.] reports a case in which the pressure of a corset caused complete division of a portion of the right lobe of the

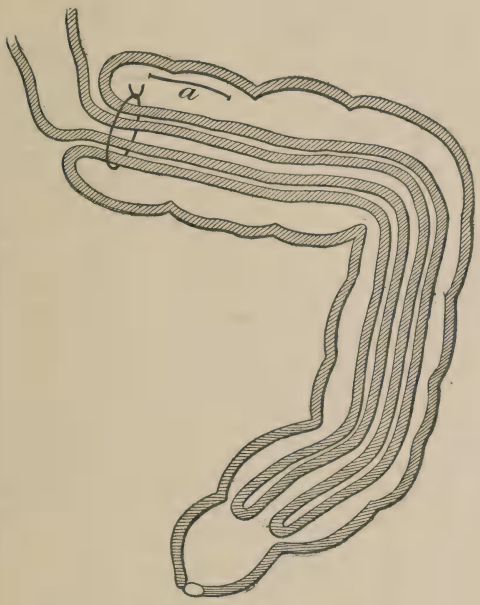


FIG. 1.—INTUSSUSCEPTION.
(*Deutsche Med. Woch.*)

liver, carrying with it the gall-bladder. The latter, containing a calculus, was united with the transverse colon by peritoneal adhesions. The mass was pressed upward, causing complete obstruction. Bier [69 June 8; 112 Sept.] reports a case of invagination followed by death after laparotomy,—the formation of an artificial anus, and a secondary enterorrhaphy with lateral anastomosis. The condition, an invagination of the ileum into the upper part of the colon, is shown in Fig. 1. The first stage of the operation is seen in diagram in Fig. 2, and the final part of the procedure in Fig. 3. A second case of invagination in the sigmoid flexure was relieved by Simon's

method, the hand being passed into the rectum to untwist the bowel.

Intestinal Obstruction.—J. R. Comte, of Geneva [197 Apr.20] believes that all cases of intestinal obstruction should be treated in the same way as strangulated hernia, as soon as diagnosed. He considers statistics worthless in comparing the results of surgical and medical treatment, unless the operation has been performed in every case within twenty-four hours. He reviews the various methods of treatment, which may be classified as follows: 1. Among *non-operative* measures may be mentioned opium, which masks the symptoms by controlling pain and efforts at vomiting. It quiets peristalsis and strengthens the pulse. Of 50 cases treated by this drug,

Fig. 2.

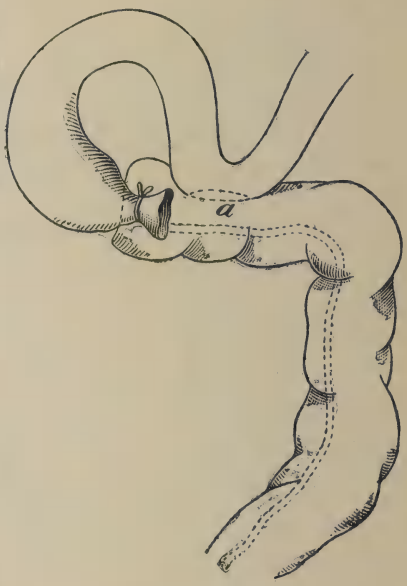


Fig. 3.

Intussusception Operation.
(*Deutsche Med. Woch.*)

15 recovered; and among 29 autopsies it was demonstrated very clearly that 10 could have been relieved and 19 cured if a timely laparotomy had been resorted to. 2. Purgatives are dangerous. 3. Massage is useful when calculi are present or the obstruction is due either to the presence of fæcal impaction or a foreign body, but it is dangerous in other forms of obstruction. 4. Electricity may be useful in the same conditions as massage, but weak heart and collapse are contra-indications to the use of either. 5. Siphonage of the stomach, while it relieves distressing symptoms, is dangerous, because it gives a feeling of false security.

It is well to always empty the stomach by this means, however, previous to a laparotomy, in order to prevent vomiting. 6. High rectal injections of warmed water or oil, in the knee-elbow position, may pass the ileo-cæcal valve, and would be useful, therefore, in cases of fæcal obstruction, invaginations, and simple constrictions, but only a waste of time in other forms of obstruction. 7. The injection of gas, or waters charged with gas, to be of any practical use would have to exert an amount of pressure extremely dangerous for the patient in the weakened condition of the intestines.

In speaking of the *surgical* treatment of intestinal obstruction, he believes: 1. That intestinal puncture by a fine trocar is only a palliative measure, and should be resorted to only in cases of extreme dyspnœa and as a last resort. 2. Laparotomy may be performed for three different reasons: (*a*) to remove obstruction; (*b*) to resect a thickened or diseased portion of the gut; (*c*) to form an artificial anus. He does not think that childhood is a contra-indication to laparotomy, but as collapse developes quickly in children, and as the heart's action is not fully matured, he advises prompt action. Old age is a decided contra-indication, from the inherent weakness of the heart and the usual accompaniment of arterial sclerosis. In simple acute cases he advises a *very* short trial of medical means, followed by a prompt laparotomy if these measures are unsuccessful. In subacute cases, as soon as the diagnosis is reasonably sure, an operation should be performed. In chronic cases every medical method should be carefully tried before resorting to laparotomy. When the general condition of the patient is unfavorable, he advises passing a siphon tube into the stomach and the performance of colotomy.

F. H. Wiggin, of New York, $^{59}_{\text{July 23}}$ details the history, diagnosis, etc., of ten interesting intestinal cases, of which three were cases of intussusception. In the discussion which followed the reading of a paper by Joseph Coats, of Glasgow, $^{213}_{\text{Mar., Apr.}}$ before the Pathological and Clinical Society, James Finlayson, of Glasgow, said that he had seen only one case of successful operation for intestinal obstruction due to a mechanical cause, and that was performed by William Macewen. The patient, a child of 9 months, had suffered from intussusception, and was shown, three months after operation, in good condition. W. E. Ashton, $^{9}_{\text{July 30}}$ reports four

cases of intestinal obstruction, of which three recovered, and takes up the pathology of intestinal obstruction following abdominal and pelvic operations. John Homans, of Boston, $^{99}_{\text{Aug.11}}$ records nine cases of intestinal obstruction due to cancer and seven to other causes, seen in his own practice.

A. B. Holder, of Memphis, Tenn., $^{849}_{\text{Mar.}}$ reports six dissimilar cases of intestinal obstruction, with a few general conclusions as to the symptoms and treatment. J. C. Irish, of Lowell, Mass., $^{99}_{\text{Aug.11}}$ contributes two cases which terminated successfully, although both were in a desperate condition before operation. Lucas-Championnière $^{91}_{\text{Mar.}}$ reports five cases in which he found it necessary to perform laparotomy for the relief of internal strangulation following operation on the intestines. In the first case, symptoms of obstruction developed on the eighth day after ovariotomy. The obstruction was found to be due to old adhesions of the intestines with a mass of omentum. The primary operation in three cases was for the radical cure of hernia, and, in the fifth case, for strangulated hernia. The post-operative obstruction was due in three instances to adhesions, and in one to the pressure of a large intra-peritoneal effusion of blood. All these patients made a good recovery after the second operation.

P. B. Mason, of Burton-on-Trent, $^{6}_{\text{July 2}}$ and George Krieger, of Chicago, $^{1052}_{\text{June}}$ each report interesting cases. Alexander MacCormick $^{267}_{\text{June 15}}$ has observed two cases of intestinal obstruction from bands of lymph. Operation was followed by recovery. G. A. Wright, of Manchester, $^{6}_{\text{July 16}}$ has seen one similar case with equally favorable result. James G. Smith, of Bristol, $^{2}_{\text{Mar.12}}$ advocates operation, evacuation and drainage of intestinal contents, in cases of obstruction where distension is a marked feature. R. H. M. Dawbarn, of New York, $^{19}_{\text{Aug.6}}$ and Joseph Price, of Philadelphia, $^{1054}_{\text{Mar.}}$ have written articles on the surgical treatment of this condition.

Boiffin, of Nantes, $^{3}_{\text{Apr.20}}$ records seven cases, and concludes that operation should not be postponed any longer than is absolutely necessary, on account of the danger of septic infection from delay. L. Revilliod $^{197}_{\text{Sept.20}}$ emphasizes the importance of a very careful diagnosis in these cases, as intestinal obstruction has been frequently confounded with hysteria, hepatic colic, crises in locomotor ataxia, and certain forms of poisoning. Julliard $^{197}_{\text{July 20}}$ considers that, as the diagnosis of the exact cause of intestinal obstruction is often diffi-

cult, laparotomy should not be postponed until the cause is clearly established, but should be performed as soon as symptoms of obstruction develop. In 18 operations, 12 cases died and 6 recovered. Autopsies on those that died showed that a fatal result must have occurred without operative interference, which offered their only chance of recovery. J. L. Reverdin $\frac{197}{\text{Sept. 20}}$ advises that a case should never be left until the cause of obstruction has been determined. Operation, even though undertaken at a late date, offers the only chance; and if death does occur, it should not be attributed to the operation. Kummer $\frac{197}{\text{Sept. 20}}$ states that fever in such cases is not necessarily due to the presence of peritonitis, but may come from the absorption of pyogenic material elsewhere. The great danger in these cases arises (1) from inanition; (2) from septic poisoning from the absorption of fæcal matter; and (3) (the most imminent of all) from perforation.

Laparotomy should be performed with the nearest possible approach to asepsis, and a careful search should be made until the cause of the trouble has been found. William Alexander, of Liverpool, $\frac{187}{\text{July}}$ details two cases with recovery after operation. Selenkow $\frac{21}{\text{June 20}}$ treated a patient for symptoms of intestinal obstruction developing in the course of chronic constipation. After opening the abdomen, signs of diffuse peritonitis were found. The ileum and ascending colon were twisted upon their mesentery and bound down by inflammatory bands. Death occurred two days after operation. Cnopf, Sr., $\frac{34}{\text{Aug. 9}}$ reports a case, aged 73 years, on whom a laparotomy was performed for symptoms of intestinal strangulation which, on section, were found to be caused by a right-sided ovarian cystoma. Both ovaries were removed. Patient recovered.

W. L. Schaefer, of Ridgeville, Ohio, $\frac{9}{\text{Jan. 9}}$ records a case of acute internal strangulation of the bowel in a child 2 years of age, there being a complete twist of the small intestine about four inches above the ileo-cæcal valve. Laparotomy was performed; death resulted. R. Muzio Williams and John R. Lunn $\frac{6}{\text{Jan. 23}}$ contribute a case of double internal strangulation from three adventitious bands; abdominal section; death.

Bryant $\frac{1}{\text{June 25}}$ operated on a man for intestinal obstruction by a fibrous band, which was removed, the intestine opened and cleaned, and the abdominal cavity cleansed. The patient lived only fourteen hours.

Oscar Bloch, of Copenhagen, [100 July 7] operated for cancerous obstruction of the sigmoid flexure. The neoplasm and twenty-five centimetres were fixed in the iliac region and an artificial anus established. Twenty-nine days later the cancer was resected and the intestinal ends united. Two days later flatus escaped from the anus; ten months afterward patient returned with a cancer of the liver.

Allen [9 Aug. 13] says that Meckel's diverticulum, which may cause intestinal obstruction, is the remains of the omphalo-mesenteric duct extending from the lower portion of the ileum through the umbilicus to the embryonic yelk in fœtal life. In the cases that he has examined its location has been from fifteen inches to three feet above the ileo-cæcal valve. Among three thousand four hundred post-mortem records made at St. Bartholomew's Hospital, London, it was found to be present twenty-seven times, and the diverticulum was four times more frequent among males than females. Oderfeld [6 Jan. 30] publishes the particulars of an operation for acute obstruction of the bowel caused by the presence of Meckel's diverticulum. The distal end of the diverticulum had become attached to the mesentery, thus forming a loop through which a coil of intestine had slipped. The excessive formation of gas in the bowel had compressed the knuckle of intestine and caused it to become fixed. The author, in performing laparotomy, freed the incarcerated coil by separating the adherent end of the diverticulum, and to prevent a relapse he removed the latter by a circular incision at its base. The patient recovered.

Baudoin [1043 Aug.] has seen 27 cases of intestinal obstruction from calculi. In 21 enterotomy and enterorrhaphy were performed; 6 recovered. Of the remaining cases which were not operated upon (6), 1 only recovered. A. A. Brockatt, [6 May 21] operated upon a man of 43 years for acute obstruction due to a large gall-stone. The patient lived six days after the operation. A. Broca [7 July 1] contributes two cases of intestinal occlusion in which the lesion was in the region of the cæcum, without appendicitis. In one a loop of constricted intestine was not perforated, but was surrounded by an abscess. Death ensued from subsequent pneumonia. In the second case the constriction was from an inflammatory band around the inferior surface of the cæcum. Perfect recovery.

Garré [336 Aug. 13] records a case of cicatricial intestinal stenosis

(caused by sloughing of the mucous membrane) following an operation for strangulated inguinal hernia. A laparotomy was performed for symptoms of stenosis nine weeks after the herniotomy, forty-one centimetres of intestine being resected, with a favorable result.

A remarkable case is recorded by Harris, of Parkersburg, W. Va. [186 July] A boy aged 16 had suffered for three days from obstruction of the bowels; he was collapsed, with a pulse of 170, a temperature of 95° F., and symptoms of peritonitis. Cœliotomy was performed, giving exit to a gush of foul liquid like pea-soup, with brownish particles floating in it, and a fæcal odor. The wound was closed, with drainage. On the seventh day the boy got up to have a movement; the wound burst open and the bowels protruded. The edges were freshened and sutured, but ten days later they separated again. A new adjustment was made, and re-inforced by a "dry suture" with rubber plaster, after which recovery ensued without further accident.

The following writers contribute articles on this subject, with interesting cases: Merigot de Treigny, of Paris [22 Aug.17]; J. W. White, of Philadelphia [112 Oct.]; Dezanneau, of Angers [3 Apr.20]; J. P. Doyle [16 Apr.]; Enrique Tornei [542 May]; Byron Robinson, of Chicago, Ill. [850 June]; Villar [188 Dec.13,'91]; Michie [2 Apr.23]; Abbe, of New York [22 Apr.2]; Boiffin, of Nantes [22 Apr.27]; J. Irving, of Huddersfield [2 Apr.30]; Coates [2 Apr.23]; J. B. Draper, of Kansas [430 Mar.]; James Murphy, of Sunderland [22 Apr.13]; George W. Williams, of Pittsburgh, Kansas [430 Jan.]; Don Francisco Domínguez Adame [634 May 31]; D. A. Kirk, of Le Sueur, Minn. [105 Dec.15,'91]; Edward Atkinson, of Leeds [6 May 7]; Cleghorn, of Blenheim [557 Apr.]; Percy Ashworth [2 Feb.6]; A. Rabagliati [22 Dec.23,30,'91]; Gray [2 Mar.26]; J. C. McClintock, of Topeka, Kansas. [72 Feb.]

Laparotomy.—George W. Miel, of Denver, [155 June] believing that few operations are unattended with some form of delay which might be avoided, calls attention to this subject in a very practical way, and offers a few suggestions toward rendering the technique as thorough and as rapid as possible. Horace T. Hanks, of New York, [22 July 13] believes that, in order to prevent mural abscesses, sinuses, and ventral hernia after laparotomy, an incision should be made large enough to enable the surgeon to work without difficulty in the pelvis; he should especially avoid injury to the lips of the wound while the hands are in the cavity. Wathen [224 Mar.12] calls attention to a case of recent abdominal section. He believes that when

asepsis is secured such complications as stitch abscesses and hernia cannot occur. Emory Lanphear, of Kansas City, Mo., $^{546}_{\text{Apr.}}$ performed laparotomy under cocaine, upon a man of 52, who was almost *in extremis* at the time, with little or no shock from the operation. Stephen Paget $^{2}_{\text{Apr.16}}$ contributed an example of acute parotitis, of which he has collected upward of one hundred instances occurring after injury or disease of the pelvic organs. He considers that this inflammation of the parotid gland is due to reflex nervous action, and not to pyæmia. F. B. Jessett $^{6}_{\text{July 9}}$ advances some principles to be observed in the closure of abdominal incisions, and T. J. Beattie, of Kansas City, Mo., $^{72}_{\text{May}}$ writes on the after-treatment of laparotomy. Carstens, of Detroit, $^{185}_{\text{June}}$ publishes a brief statement of a year's work in laparotomy, embracing fifty-three cases of all kinds, with a mortality of only four, or a fraction over 7 per cent. Some of the most seemingly hopeless cases did well. Every case was operated on which offered any chance of success. Duplay $^{17}_{\text{Nov.26,Dec.1,'91}}$ discusses the physical effect of operations *per se*.

Küstner, of Dorpat, $^{69}_{\text{Jan.7}}$ believes, from a series of one hundred and thirty-two laparotomies, that the adhesions which so often follow are the result of sepsis, and not of the mechanical irritation produced by the sutures or by the cautery. Exploratory incisions should only be made in cases in which the indications point to a continuance of the operation, and should always be large enough to admit the hand of the operator. The common diagnosis of tuberculosis of the peritoneum is combated. One case is reported in which the microscopic appearance was precisely that of tuberculosis. The peritoneum, visceral and parietal, was covered with tubercles. A second operation, some weeks later, showed marked improvement. Careful microscopic examination in this case showed no bacilli, and injection into the peritoneum of a guinea-pig gave no result.

It would seem, from a discussion at the Société de Chirurgie, $^{3}_{\text{Feb.24}}$ that the question of the after-treatment of laparotomy is by no means a settled one with French surgeons. The administration of a saline purgative within three or four days, advocated by Lucas-Championnière, Terrillon, Reynier, and Perier, was thought by Felizet, Quénu, and Terrier to be objectionable in some cases, where the immobilization of the intestine was safer; it was opposed decidedly by Routier and Berger. Regard should certainly be had

in each case to the condition of the intestine, and to the probability, on the one hand, of its rupture; on the other, of the formation of adhesions which may give trouble.

Albert Heydenreich, of Nancy, [3 Mar.] reviews the various operations upon the sacrum with the object of reaching the contents of the lower pelvis, unapproachable by other means, and concludes that considerable mutilation is allowable, under certain precautions and exact knowledge of anatomy and the object to be attained. S. Saxtorph, of Copenhagen, [673 Aug.] has performed the parasacral operation, after Zuckerkandl and Wölfler, in the following cases: 1. An enormous pelvic abscess, originating from an osteitis, was opened by the parasacral incision, in a man aged 21. Twenty-five days after the operation there was only a small fistula, which was healed when the patient presented himself, three months after the operation. 2. An intra-peritoneal pelvic abscess in a woman, aged 33, who was discharged from the hospital, on the thirty-seventh day after the operation, with a small, granulating fistula, which was closed perfectly seven weeks after the operation. 3. A retro-uterine hæmatocele, in a woman aged 32, left off discharging pus the thirteenth day after the operation, and the fistula healed perfectly a few days later. Perfect recovery in all three cases. (Report of Holger Mygind, corresponding editor, Copenhagen.)

Nicholas Senn, of Chicago, [99 June 80] has operated on four cases of dermoid tumor of the abdominal walls in the last two years. He believes these tumors to originate from the mesoblasts, and arise from the sheath of one of the abdominal muscles. In structure they resemble the fibromata, with some sarcomatous characteristics. His four cases occurred in child-bearing women, and were, perhaps, due to trauma of the abdominal muscles. Bodenstein, of Würzburg, [34 Jan.5] in an article on sarcomatous and fibromatous tumors of the abdominal wall, finds that most of those afflicted are women between the ages of 20 and 37, there being only one man (aged 37) among twenty cases. Only two women were nulliparous. He therefore regards parturition as the chief factor in the etiology. The prognosis after operation is good. Recurrence and metastasis seldom occurred.

Scrnel, of Louvain, [454 Jan.] reports an interesting case of abdominal tumor occurring in a soldier, aged 24, of fair personal and good family history. The main symptoms, which lasted over a period

of eighteen days, were: Intense pain, on pressure, over a large mass, which rapidly developed in the right flank; fever, sleeplessness, and complete prostration. The patient left the hospital, apparently well, in seven weeks. The diagnosis was referred to a localized inflammation of the peritoneum and mesentery, probably tuberculous in character. No operation was performed.

Lawson $\frac{22}{\text{Dec.16,'91}}$ reports a case of malignant tumor attached firmly to the pelvis. Duplay $\frac{3}{\text{Jan.6}}$ reports a case of cancer of the peritoneum relieved for some two years by exploratory laparotomy. Dreschfeld, of Manchester, $\frac{2}{\text{Apr.30}}$ reports a case of colloid cancer of the transverse colon, in which the tumor had infiltrated the neighboring tissues, become attached to the abdominal wall, and formed a large, abscess-like cavity; into this opened the transverse colon, a loop of small intestine, and also the lower end of the stomach. The man died of exhaustion. No operation was performed.

The observation of one hundred cases of abdominal tumor with ascites has led Pascale, of Naples, $\frac{84}{\text{Dec.12,'91}}$ to believe that the amount of the ascites is in direct relation to the hardness, the movability, or the rapidity of growth of the tumor. It is also associated with a marked tension upon the peritoneum covering the tumor, or with a chronic inflammation of the serous coat. Hutchinson, of London, $\frac{806}{\text{Apr.}}$ discusses some of the symptoms in abdominal tumors from retention. He gives the following *résumé* for their detection: 1. The distension, though enormous, is usually quite painless. 2. The retention is never absolute, but only residual. There is always overflow. 3. The patient never assists the surgeon, but rather misleads him, insisting that there is free relief of bowels and bladder.

Duret, of Lille, $\frac{220}{\text{Apr.8}}$ reports a case of large fibrolipoma of the descending mesocolon. There was also marked prolapse of the uterus, and operation was advised, the diagnosis being a solid tumor of the adenoid variety, probably originating from the left ovary. Laparotomy revealed a solid tumor of the mesocolon; twelve centimetres of the large intestine were resected in removal of the growth. Death followed from shock. Herzfeld, of Vienna, $\frac{8}{\text{No.10,'91}}$ removed three lipomatous tumors, of the combined weight of 7550 grammes ($15\frac{1}{2}$ pounds), by laparotomy, from one patient. The first was retroperitoneal, the other two between the layers of the mesentery in the ileo-cæcal region.

Retroperitoneal Tumors.—Heim, of Vienna, [57 Sept.4] reports a case of a girl, aged 3½ years, on whom an exploratory laparotomy was done for sarcoma of the retroperitoneal glands. It was impossible to remove the tumor on account of great vascularity and the very broad attachments of the growth. The patient dying four days after operation, an autopsy was made, at which the above diagnosis was confirmed. Adhesions of the tumor to the stomach, duodenum, liver, and transverse colon, with chronic tuberculosis of both Fallopian tubes and peritoneum, were also demonstrated. A. Hadges, of Cairo, [996 Aug.25] reports a case of retroperitoneal sarcoma, with a central zone of degeneration, weighing 11 kilogrammes (24 pounds), and adherent to adjacent abdominal viscera, and to the aorta as far as its bifurcation. An exploratory laparotomy and removal of a small amount of contained caseous matter caused relief for five months, but subsequent enlargement and death followed.

Hydatid Cysts.—Dreschfeld, of Manchester, [2 Dec.5,'91] exhibited a specimen of hydatid cyst, which had its origin from the upper lumbar vertebræ,—extra-peritoneal. It had given rise to but few symptoms during life. Robert H. Jones, of Melbourne, Australia, [267 Nov.15,'91] reports a case of large abdominal hydatid cyst, which was removed by laparotomy. The unusual features of the case were as follow: 1. The large size of the cyst and the great numbers of daughter-cysts contained (they were estimated at 27,520). 2. The absence of the mother-cyst at time of operation. 3. The vermillion concretion and staining of the daughter-cysts with some pigment; this pigment was thought to be derived from effused blood,—and probably hæmatoidin. Albert, of Vienna, [8 May 26] reports two cases of echinococcus: one covering the peritoneum, the second occurring between the bladder and rectum. Abdominal section was performed on both cases, with speedy recovery in the first, recurrence in the second.

Joseph Eastman, of Indianapolis, [81 Mar.] reports a case of dermoid cyst in a male. John B. Deaver, of Philadelphia, [112 June] reports the removal of dermoid cysts from a case previously reported by W. W. Keen.

Madelung, of Rostock, [336 July 30] in an article on primary sarcoma of the small intestine, makes some observations on fourteen cases of the same. Sarcoma originates generally in the submucosa,

seldom going as far as the serosa. Metastasis occurs early in the lymph-glands, the mesentery, liver, and kidneys. Most of the cases were between 30 and 50 years of age. The oldest was 52, the youngest 4. Out of fourteen cases only one was a woman. The duration of most cases is very short, one case being sick only two weeks; the majority lasted only nine months. Death was usually due to general exhaustion, in consequence of the formation of intra-peritoneal abscesses. Madelung operated in two cases, both dying—one twenty-four hours, the other nine days—after the operation.

D. Veremundo Cabrera, of the Island of Teneriffe, [494 Apr.30] performed a tentative operation upon a case of abdominal sarcoma which, after death, was found to be attached to the lumbar vertebræ and abdominal aorta, and to weigh 24 pounds (11 kilogrammes).

Cæcum.—Matlakowski, of Warsaw, [301 B.33,H.4,5] concludes that carcinoma of the cæcum is not rarely a most chronic condition that may exist for years without giving rise to symptoms other than slight constipation and the presence of a tumor. The prognosis of operation at this stage would be most favorable. Resection, with immediate enterorrhaphy, is the ideal operation.

Goodsall [2 Nov.28,'91] has opened the cæcum in two cases of obstruction. The first was in a man of 46 years, who had been vomiting for nine days and had absolute obstruction of the bowel for six days. The patient died shortly after operation. The second case, a man of 34, recovered. Salzer, of Utrecht, [226 p.101] reports 25 cases (from Billroth's clinic) of operations for chronic cæcal diseases: Operations for cancer of the cæcum in 8 men and 2 women,—resection, 2 men and 2 women, recovered; for tuberculosis and ulcerative intestinal stenosis, 4 men and 1 woman,—3 men and 1 woman recovered; for fæcal fistula, 3 men and 5 women,—3 women recovered. Intestinal suture was performed in 4 cases, intestinal resection in 18 cases, and intestinal anastomosis in 3 cases.

Gross, of Nancy, [3 Feb.18,June 11; 2 Mar.12] discusses the indications for ileo-colostomy in cases of ulceration and tumor of the cæcum. Although this operation has not been performed frequently, much attention has been paid to it, especially by German surgeons, and its methods have been improved by Salzer and Hochenegg. In the procedure advocated and successfully practiced by later sur-

geons, the two ends of the diseased portion of gut, which has been completely separated from the rest of the intestinal tract, are fixed to the edges of the external wound in order to promote the discharge of mucous and purulent secretion.

Rosenthal [113 Nos.12,18,21] has collected 151 cases of intestinal resection operated on since 1880, tabulated as follows:—

Hernia, . .	42	times	with	a	mortality	of	40.5	per	cent.
Artificial anus, .	44	"	"	"	"	"	43.2	"	"
Neoplasms, .	28	"	"	"	"	"	46.5	"	"
Obstruction, .	21	"	"	"	"	"	48.0	"	"
Wounds, . .	16	"	"	"	"	"	37.5	"	"
Total, . .	151	"	"	"	"	"	42.3	"	"

He also reports the following cases from Klausenberger's clinic: 1. Boy, aged 15 months; incarcerated inguinal hernia. Herniotomy. Cæcum perforated, resection, suture, recovery. 2. Man, aged 53; incarcerated inguinal hernia. Resection of cæcum and part of the ileum and ascending colon. Suture, recovery.

Sachs [226 p.429] reports a case of extirpation of the cæcum for tuberculosis, afterward found to be lupus of the mucous membrane of same, which prior to extirpation was diagnosed as a tumor. Von Winiwarter [293 June] reported a case on whom he had done a laparotomy (the day before report) for chronic inflammation of the region of the cæcum. At the operation, the cæcum, omentum, and vermiform appendix were found adherent to one another; a few spoonfuls of thick pus were found in a cavity behind the cæcum, but there was no evidence of perforation. As the vermiform appendix was much thickened, it was removed by thermo-cautery. The author recommends resection of the cæcum when it is perforated. Hochenegg, of Vienna, [84 Dec.12,'91] showed a patient, aged 33 years, on whom he had performed ileo-colostomy for stenosis of the cæcum, caused by a tumor. The lower ends of the ileum and cæcum were cut off, the two pieces of intestine united by circular sutures, and the extirpated piece of intestine sewed in the abdominal wound (this being a modification of Salzer's method). He gives the following indications: (1) in malignant cæcal tumors, with or without stenosis; (2) in chronic inflammatory processes of the cæcum; (3) in fæcal fistula in this locality.

Chaput, [3 Aug.17] in establishing an artificial anus, recommends the

use of a circle of eight hæmostatic forceps to replace the sutures uniting the intestine to the peritoneum and abdominal wall. The forceps are to be left in place for twenty-four hours, when, upon removal, their pressure will have been found sufficient to have produced firm adhesion. This method has the advantage of ease and rapidity, and avoids the danger of penetrating the peritoneal cavity.

A. R. Anderson, of Nottingham, $^{2}_{May\ 28}$ reports a successful operation for fæcal fistula at the umbilicus which had persisted some months; the patient, a boy aged 8 years, was losing flesh and strength rapidly, and laparotomy was performed. The numerous intestinal adhesions were torn, and the fistula was found in the cæcum; the appendix was normal. The boy recovered rapidly; the origin of the condition was supposed to be a suppurating mesenteric gland. McArdle, of Dublin, $^{16}_{Mar.}$ reports a case of fæcal fistula following removal of abdominal tumor. He sums up his conclusions as follows: (1) early interference is unjustifiable when the fistula is from a fixed portion of the intestine; (2) when operation is demanded, it should be thorough and aim at the closure of the intestine.

Colotomy.—A. W. Mayo Robson, $^{2}_{Jan.9}$ while performing enterostomy five years ago, was convinced that it would facilitate operative interference if the bowel already stitched to the side could be punctured with a large trocar and cannula, from which a tube would be able to carry off the fæces into an antiseptic solution placed by the side of the patient, and so prevent fouling of the peritoneum or of the wound. He has devised a special trocar for this purpose, and has employed the method with sufficient frequency to speak with some authority of its usefulness. H. A. Reeves $^{2}_{Feb.6,13}$ employs a method of sigmoidostomy recommended by Maydl, of Vienna, and simplified by Reclus, of Paris. A polished vulcanite rod, previously dipped in carbolized oil, is forced through the mesentery of the sigmoid flexure after that portion of the intestine has been drawn through the abdominal wound. This rod is secured on the outside of the abdominal wall, between small pads of lint at each end, and protective is applied, smeared with carbolized oil (1 part in 60), over the intestinal loop after the incision through the skin and muscle has been sutured. A thick roll of gauze is then placed around the bowel, and a layer of cotton-wool

over the protective, so as to prevent undue pressure when the binder is applied. At the end of a week or so the bowel is opened longitudinally and the intestinal ends stitched to the skin. The simplicity of this operation is such that the writer has performed it in seven minutes in a favorable case. He has operated on four cases in this manner with excellent results.

F. Marsh, of Birmingham, $^{2}_{\text{Feb.6}}$ has adopted this procedure in all suitable cases, with one or two slight modifications in the technique of the operation.

F. T. Paul, of Liverpool, $^{2}_{\text{July 23}}$ recommends a glass drainage-tube bent in the middle at a right angle, for use in the cæcum, colon, and rectum. It measures five inches in length and one inch in diameter for the large intestine, and a smaller size for the small intestine. He has found the larger tube of service in extensive excision of the rectum by Kraske's or Alexander's method. In three cases in which he has placed one of these tubes into the rectum, no difficulty was experienced in keeping the immense wound aseptic during the first four or five days, notwithstanding that no preliminary colotomy was done, and quantities of fæces escaped daily.

J. Matthews $^{61}_{\text{June 6}}$; $^{99}_{\text{June 30}}$ considers the inguinal operation no safer than lumbar colotomy, because the former is intra-peritoneal, while the latter is extra-peritoneal.

Harrison Cripps $^{2}_{\text{Dec.26,'91}}$ has contributed some remarks on fibrous stricture of the colon, with the history of two cases, diagnosed by laparotomy and treated by colotomy. Both cases recovered. H. Littlewood $^{6}_{\text{Apr.16}}$ reports a successful case of sigmoidostomy after Senn's method, for intestinal obstruction due to malignant disease of the hepatic flexure. Thomas S. Roberts, of Minneapolis, $^{105}_{\text{Jan.15}}$ performed inguinal colostomy in a case of eighteen month's duration, the favorable result of which, he considers, illustrates the advantages of the anterior operation.

Gould $^{22}_{\text{Apr.13}}$ performed colotomy on a woman of 76 years, who had suffered from chronic diarrhœa, in whom almost complete stoppage of the fæces had occurred, and the abdomen was enormously distended. George Goodfellow, of Tombstone, A. T., $^{147}_{\text{June}}$ opened the sigmoid flexure in a man 50 years of age, by the method of Allingham, for cancer of the rectum. Considerable relief was experienced, and the painful symptoms almost completely

disappeared. The patient lived upward of eighty hours, dying in comparative comfort. William Thomson, of Dublin, [16 Feb.1] performed anterior colotomy in five cases, with excellent results, as well as three cases of enterotomy. M. Price [23 June; 1003 June] performed colotomy in two cases, in the left inguinal region, for obstruction of the bowel. One patient is still living, with the bowel almost under perfect control, except when she has diarrhœa, and the other case lived for four months after the operation.

W. H. Young, of Goshen, Ark., [65 Apr.] was called to see a girl, 14 years of age, who, while climbing a peach-tree, had fallen head-foremost some ten feet, striking the sharp end of a fence-post, which passed into the abdominal cavity. The point of the post struck the transverse colon, divided it transversely, and tore it loose from its attachments. The removal of from eight to nine inches of the intestines was necessary. A large semilunar fold of the omentum was also removed, necessitating the application of several stitches. The patient's recovery was continuous, and she was finally restored to health. Bland-Sutton [22 May 4] operated on a man of 80 for a large pelvic tumor pressing on the rectum, and secured relief for the sufferer by lumbar colotomy. Christopher Heath [2 June 4] has operated several times on similar cases in his clinics at the University College Hospital. Rutherford Morrison, of Newcastle-on-Tyne, [22 Aug.3] reports a successful ileo-colostomy for malignant growth of the ileo-cæcal valve; the patient, aged 57, died some months later, from bronchitis; microscopical examination of tumor revealed a cylindrical carcinoma. A case of ileo-colostomy is reported by Sir William MacCormac. [6 Feb.6] A fæcal fistula persisted after operation, which was closed by a plastic operation. When last heard from, the man, a blacksmith, was at work, with site of operation firmly healed. The examination of removed gut demonstrated the growth to be carcinomatous.

T. S. Roberts, of Minneapolis, [105 Mar.1] reports a case of inguinal *colostomy*, performed for papilloma. Richardson, of Boston, [99 June 21] exhibits a specimen of malignant tumor, involving the descending colon; about four inches of the colon and sigmoid flexure were removed in operation. O. Bloch, of Copenhagen, [996 May 10] reports a case of cylindrical carcinoma of the sigmoid flexure, in which he fixed about twenty-five centimetres of the intestine outside of the abdomen. A month later the cancerous portion was removed.

APPENDICITIS.

Etiology.—Roux, of Lausanne, $^{3}_{\text{June 1}}$ says that the origin of suppuration and perforation of the appendix can be largely laid to the presence of micro-organisms and the loss of vitality which they occasion at the site of their activity. Recovery under medical treatment is the rule in non-suppurative cases, but is only possible in the suppurative. Kümmel, of Hamburg, $^{226}_{\text{No. 43}}$ believes that perityphlitis is caused primarily by the swelling of the mucous lining of the cæcum, preventing the emptying of the appendix; this produces a chronic catarrh, followed by ulceration, stricture, and infection of the peritoneum through the defect in the mucous membrane without perforation through the lymph-channels. After this follow adhesive inflammations. If the process is so far advanced that pus forms, absorption is not to be expected and surgical interference is indicated. Perforation generally occurs behind the point of stricture. He believes that the appendix should be removed at the cæcum, and reports twenty cases, all of which recovered. Hartley $^{1}_{\text{June 25}}$ has found that, in three hundred and twenty-four cases of so-called perityphlitis collected from various authors, two hundred and eighty-two times the appendix was found to be the seat of the disease; so that the importance of the appendix as a starting-point for disease and the frequency of its involvement are beyond dispute. Robson $^{6}_{\text{Feb. 13}}$ divides pericæcal inflammation into two groups: (1) appendicitis without suppuration dependent on ulceration or catarrh, and producing local peritonitis which has a tendency to resolution, but which is also liable to recur; and (2) perforating appendicitis, ending in suppuration and producing either a local abscess or diffuse peritonitis.

Schede, of Berlin, $^{69}_{\text{June 8}}$ assigns, as the cause of all typhlitis and peri- and para- typhlitis, an inflammatory process in the appendix, due to its occlusion either by fæces, fæcal calculi, stricture, or, more seldom, foreign bodies. Of the milder cases in which there is a swelling, slight exudate, and no pus, he reports three cases with good recoveries. In the more severe forms with profuse exudation and suppuration, the presence of perforation is general, and there is no doubt in his mind that many of these cases do well under medicinal treatment. He believes they should be opened like other abscesses, and especially the para-typhlitic and extra-peritoneal, which have a tendency to burrow, and may even produce empyema.

Of this severe form he reports three cases with recovery. Of his third or most virulent form, the acute perforating, with general peritonitis, he reports twelve cases varying in intensity and the amount of adhesions present. There were eight recoveries.

Richelot [17 Apr.2] believes that judgment should not be passed too hastily on tumors in the cæcal region, and reports eight cases in which tumors of that region were connected with the cæcum, but were not due to appendicitis or perforation, but were of tubercular origin and in one case epitheliomatous. These observations make him believe that tubercular appendicitis is more frequent than has generally been supposed.

Lanz [214 June 15] reported two cases of tubercular disease of the intestine which were healed after resection. At the operation a stenosis of the gut was found, due to infiltration. The second case was of stenosis at the ileo-cæcal valve; the mucous, submucous, and muscular coats were infiltrated with tubercular nodules. Terrier [3 Feb.24; Apr.6] reports a case of tubercular typhlitis for which he removed the appendix. The patient improved, but diarrhœa set in and a small intestinal fistula formed. At the date of writing she had tubercular peritonitis. Delorme [3 Apr.6] reports four cases, one an acute appendicitis followed by death, and tubercular cases with recovery after operation. He believes that these tubercular cases are not infrequent and as numerous as Richelot believes them to be.

Jalaguier, of Paris, [3 June 8] in a bacteriological examination of the pus from a case of appendicitis, found numerous bacilli coli, the staphylococcus aureus, the bacillus subtilis, and some lactic bacilli. He also reported fourteen cases of operation for purulent peritonitis following disease of the cæcum and its appendix; of these twelve died and two recovered; notwithstanding the great mortality, he considers the operation most justifiable, but not to be performed when the patient is *in extremis*. Berger, of Paris, [3 June 8] reports four cases of operation for perforating appendicitis, with fatal result in each case; he thinks the operation was performed too late. Quénu, of Paris, [3 June 8] groups the lesions of the cæcum and its annexes under three heads: (1) typhlitis and perityphlitis in the aged and infirm, in which there is but little hope from operation; (2) the true acute appendicitis, or the chronic recurrent type; (3) acute general peritonitis. This last form is extremely difficult to diagnose; he reports such a case with operation and fatal termination.

The recurrent cases usually recover. Roux had eight cases, eight recoveries. Swartz and other surgeons had obtained analogous results.

Diagnosis.—John B. Deaver, of Philadelphia, $^{9}_{\text{Aug.6}}$ in writing of inflammation in the right iliac fossa associated with lesions of the cæcum, the vermiform appendix, or adjacent tissues, divides the several forms into two classes, for clinical convenience, namely: Intra-peritoneal and extra-peritoneal. The former includes those cases of so-called appendicitis, typhlitis, and perityphlitis; the latter, all cases of inflammation in the right iliac fossa having their origin within the peritoneum and associated with lesion of the cæcum or the appendix. He makes this classification because (1) he believes it impossible to differentiate between appendicitis, typhlitis, and perityphlitis; and (2) because the terms typhlitis and perityphlitis are misleading, and, so long as it is taught that they are distinct affections independent of trouble with the appendix, the physician is sure to be misled. The article contains a differential diagnosis table to support the suggestion made.

Schede, of Berlin, $^{34}_{\text{Apr.26}}$; $^{22}_{\text{Sept.7}}$ believes that perityphlitis does not run an extra-peritoneal course, as is generally believed, but that intra-peritoneal inflammation is the rule. He recognizes several groups of cases: (1) where the integrity of the walls of the vermiform appendix remains unimpaired and only passing obstruction takes place; (2) where there is injury to the walls; (3) where acute inflammation takes place with or without perforation; (4) complicated cases. In the first group, after frequent relapses occur, resection is indicated. He has twice operated in such cases with success. In the second group there is general peritoneal suppuration, usually with perforation; fæcal calculi are frequently found within the appendix. Spontaneous recovery or inspissation of the pus may take place. Schede is not in favor of Sonnenburg's proposed operation in two stages (*vide* ANNUAL, 1892, iii, C–93). It is not always necessary to remove the appendix, but it is indispensable to success to remove the pus and *débris* lying between the intestines. These collections should be scraped and the cavities filled with iodoform gauze. He has operated on three such cases. In the third group, where there is acute inflammation with perforation, the surgeon is almost always called too late and laparotomy only hastens the end. He has seen recovery take place

once out of four such cases. To the fourth class belong all other cases, and the diagnosis can only be rendered certain by laparotomy.

Ball, of Dublin, [16 Aug.] points out that, as the appendix is altogether covered with peritoneum, the disease is always, in the first place, intra-peritoneal; but that limiting adhesions may render an abscess, for practical purposes, extra-peritoneal. Graser [34 Mar., Apr.] reports eighteen cases of perityphlitis. He believes the suddenness of the attack, together with severe pain and vomiting, with no other known cause, followed by a remission of symptoms, as shown in the most of these cases, is diagnostic of perforation. Jumon [3 Sept. 1] reports a case of actinomycotic appendicitis. The differential diagnosis is based upon its slow, painless growth; the tissues about it are infiltrated, and there are numerous fistulous tracts formed. It differs from tubercle in having no involvement of glands, and in being isolated and circumscribed in the peritoneal cavity. The treatment is that of a purulent appendicitis, the care required in eradicating the disease being necessarily greater. Lanz [214 May 15, June 1] reports two cases of perityphlitic actinomycosis.

Treatment.—Roux, of Lausanne, [197 Sept., Oct., Nov., '91, Jan.] after an extensive experience with this class of cases, insists on the difficulty of finding the appendix, and reports seventy-three cases of operation in one hundred cases of appendicitis. He advises operation for acute appendicitis only when the surgeon can diagnose the presence of suppuration. In relapsing cases he warmly advocates operation between the attacks. McBurney, of New York, [59 Apr. 16] says that, in his own experience and in that of many others, operations for acute appendicitis, performed at the right time and before the disease has progressed too far, are almost invariably successful. Out of upwards of fifty cases he has seen only one death. In regard to the diagnosis, he believes that the method of examining the appendix through the rectum in the early stages of appendicitis has no value whatever. He places more dependence upon early detection of the signs of suppuration.

Hansen [1086 V. 9, No. 4] declares that, in cases where relapses are frequent and increasing in severity, operation is indicated in grave cases during the interval, massage in milder cases. Berger [3 Mar. 30] believes that it is better, in cases of acute appendicitis, to operate prematurely than to wait until the general symptoms become so intense; but he reports four cases that apparently demanded immediate

surgical interference which recovered under expectant treatment. Reclus $_{\text{June 22}}^{3}$ believes that the general consensus of opinion favors operation, both in latent cases with relapse and those which are accompanied by a general purulent peritonitis. As to the ordinary case of appendicitis there is a much greater diversity of opinion, though the absolute uncertainty of cure by the medical method and the danger of sudden, severe, and fatal recurrence make surgical interference the best course to pursue.

Poncet $_{\text{Apr. 20}}^{3}$ reports, among twenty-five laparotomies for appendicitis, three cases in which he found a general suppurating peritonitis, in which there was, as a cause, an enlarged, inflamed appendix, but without any apparent tendency to perforation or gangrene. Two cases in which the operation was delayed died; the other, operated upon forty-eight hours after the attack, recovered. He believes, from these, that there is a form of acute appendicitis without tumor; but with general symptoms of suppurative peritonitis that demand immediate operation. The bacillus coli and the streptococcus were the only bacteria found in the pus from the peritoneum.

Hurd $_{\text{June 25}}^{202}$ considers that the moment that the diagnosis of appendicitis has been made is the time to operate. "Operations are the most successful that are performed within twenty-four hours of the onset of the attack." Marshall, $_{\text{July 21}}^{99}$ basing his diagnosis upon acute, persistent, localized pain, with fever and retching, absence of tympanites, etc., thinks that tumor can rarely be detected in the early stages. Surgical aid should be secured if no improvement occur within forty-eight hours, and at least an exploratory incision made.

Page $_{\text{Feb. 20}}^{2}$ recommends early operation in cases in which the symptoms are severe and a distinct swelling can be felt. Ball $_{\text{June 25}}^{2}$ considers that surgical treatment should be resorted to (1) where, at the end of twenty-four or thirty-six hours, the symptoms of appendicitis are progressive instead of subsiding; (2) where a distinct tumor is present; (3) immediately on the diagnosis of diffuse peritonitis being made; and (4) in some cases of relapsing simple appendicitis. He is, however, strongly of opinion that the great majority of cases of appendicitis begin to decrease within the first twenty-four hours of the attack, and that such should be treated on purely medical lines.

Ricketts, of Cincinnati [1003 May]; Rogers [849 Jan.]; J. E. Summers, Jr., of Omaha [106 Dec.,'91]; Gould, of Philadelphia [9 Aug.6]; Wyeth, of New York, [101 July]; R. Harvey Reed, of Mansfield, Ohio [1003 July]; and John B. Deaver, of Philadelphia, [112 Apr.] discuss the subject; and Fitz, of Boston, [99 Aug.4] also advocates *timely* operative interference.

Revilliod [197 June 20] reports seventy cases of perityphlitis, eleven being cases of suppuration with four deaths. Of the seven recoveries, three discharged the pus by the intestine. Sixty-two cases were, therefore, cured by medical treatment. He advises early medical treatment with delayed symptomatic surgical treatment; or, as he puts it, "When in doubt, do not operate."

Kottmann [214 July] believes perityphlitis to be a disease for medicinal treatment, and that opium, by holding the bowels quiet, allows the pus to become encapsulated by adhesions. If the suppurative process continues, there are a few cases that are amenable to surgical treatment. Kocher [214 June 15] believes that only in cases of a second attack is operation indicated, and that perityphlitis seldom causes paratyphlitic exudation, but rather tends to form an abscess-cavity that drains into the intestine.

Jalaguier [3 Mar.16] reports five cases of appendicitis treated medically and three surgically, all with recovery. He believes operation should be delayed until vigorous medical treatment has shown itself unable to prevent increasing symptoms. Opium should be freely administered, with applications of ice externally, and milk diet; purges should not be used. Mitchell, of Cincinnati, [53 Mar.12] has seen three cases recover under expectant treatment, and Johnstone as many more. N. G. Richmond, of Fredonia, New York, [170 Aug.] reports a number of cases illustrating the results of a conservative treatment.

Richardson, of Boston, [99 Mar.17] reports two cases of appendicitis with abscess successfully treated by rectal puncture. Recognizing the disadvantages of this procedure, he distinctly limits this operation to certain conditions. He believes that rectal drainage is not as dangerous as laparotomy where the patient is moribund, and certainly offers a chance of relief. Anæsthesia is not necessary. F. Kammerer, [1 May 21] in the last few years, has resorted to this procedure a number of times, and has never seen an untoward symptom follow the use of the needle under the necessary precautions.

Technique of Operation.—Dawbarn, of New York, [19 Aug.6,Sept.21] in

speaking of the operation and how the field of operation may be obstructed by the small intestine coming in the way, offers the following suggestion: "Turn the patient over so that he rests with the left side against the bed or table, and the field of operation is uppermost. Then seize the edge of the cut in the abdominal opening with a retractor and draw it forward away from the spine. This will make a cavity into which the small intestine will fall out of the way, while the cæcum, which has a very short mesentery, cannot follow, but remains uppermost." Mixter [99 Dec.31,'91] believes that packing with iodoform gauze, after operations for the relief of abdominal abscess, is the best method known for preventing an infection of the general peritoneal cavity; that after the removal of abdominal tumors with extensive adhesions, this method is more certain to prevent hæmorrhage and sepsis than the use of a drainage-tube.

William J. Gillette [811 June] says that he has frequently poured large quantities of water into the abdomen after section, so hot as to be uncomfortable to the hand, and has never seen any harm arise from the practice, and certainly has seen good.

Tachard [3 Sept.28] reports a favorable result after operation in a case of acute appendicitis. He advises cocaine as an anæsthetic, the use of antiseptics, the washing of the pus-cavity with boiled salted water, and continuous drainage by means of a siphon.

Reclus, of Paris, [3 Feb.24] reports the following case (Régnier's): A man, aged 22 years, complained of pain in the right iliac fossa. On the seventh day of the trouble Régnier performed median laparotomy, and found the appendix enlarged, hardened, and erect. In trying to remove it pus was observed to flow; to see what he was doing he made an incision at the border of the right rectus muscle, parallel to the first one, and then connected the two by a transverse cut, making an H-shaped incision. Two drainage tubes were inserted and the incisions sutured; cure resulted. When the appendix was removed it was tumefied, but showed no sign of perforation. Page, of London; Einhorn, of New York; and Roux, of Lausanne, have reported similar cases.

Jaboulay [211 Nov.29,'91] reported sixteen cases of appendicitis in the service of Poncet, and advised prompt surgical operation. In the discussion that followed his paper, Chandeleux mentioned the case of a child in which the expectant plan was pursued, death ensuing

from general peritonitis due to perforation of the appendix. In another case in which the expectant plan was pursued, an iliac abscess formed which was easily opened and cured. Mixter, of Suffolk, Va., 99 Dec.31, '91 reports two cases of appendicitis, one associated with uterine fibroid, the other with pregnancy. Both cases recovered. Symonds, of Oxford, 6 Jan.2 describes the case of a lad of 12 years, suffering from perityphlitis, upon whom he performed excision of the vermiform appendix. Patient was out of bed at the end of a fortnight, and made a rapid recovery. J. E. Summers, Jr., of Omaha, 106 Dec.,'91 reports ten cases with six recoveries, but one of these cases cannot be counted in estimating the mortality, as the patient was dead when the doctor arrived. Stimson, of New York, 1 Feb.6 has seen recently ten cases of acute appendicitis. All of them had been treated expectantly. In three suppuration occurred; two of the patients died, and operation apparently saved the third. Lange, 1 Feb.6 in commenting upon these cases, thought that it would be found unnecessary, in the majority, to perform an operation.

Harrington, of Boston, 99 Dec.10,'91 detailed the history of a woman 39 years of age, the mother of two children, in whom a diagnosis was made of ovarian tumor; after laparotomy, not only the ovaries and their tubes were found to be diseased, but the appendix also. This case suggested to the writer the necessity of bearing in mind the possibility of a displaced appendix as a cause of pelvic disease in women, and he urged the importance of examining the appendix after laparotomy in all cases where it can be done readily.

Pinnock, of Australia, 285 Jan.15 writes of a young man, aged 19 years, who made a perfect recovery after removal of a calculus from the vermiform appendix. It weighed 14 grains (0.91 gramme), presented a flattened, circular appearance, half an inch in diameter and three-eighths of an inch in thickness. This is the third case of which he can find any record in the literature of the subject where a foreign body was removed from this organ. Maylard 213 July describes a retention-cyst which he found in the vermiform appendix at the post-mortem examination of a patient who died of chronic Bright's disease. It measured four inches in length by two inches in breadth. The dilated portion was filled with a clear, gelatinous substance, which could be turned out *en masse*. At the other end it communicated freely with the cæcum.

Dudley P. Allen, of Cleveland, O., 61 Aug.6; 99 June 30 calls attention to

the late manifestations of appendicitis and their treatment. Charles McBurney, of New York, [1 May 28] has operated with success on a fæcal fistula following a perityphlitic abscess. Robert F. Weir, of New York, [59 Feb.13] contributes practical remarks on subdiaphragmatic and rectal abscesses of appendical origin, with the report of a case. M. Rosenheimer, of Milwaukee, Wis. [9 Jan.30]; Weir, of New York [101 Jan.,Mar.]; George I. McKelway, of Philadelphia [19 Oct.15]; and E. E. Montgomery, of Philadelphia, [144 July] report cases presenting features of interest. Francis J. Shepherd, of Montreal, [59 July 2] reports a death from pulmonary embolism subsequent to an operation for appendicitis.

M. T. Scott, of Lexington, Ky., [59 Jan.23] operated on a case of suppurative perityphlitis which had ruptured into the bladder and rectum. The patient recovered. Schwartz [3 Apr.13] reports five cases of appendicitis, all recovered,—one after medicinal treatment with application of ice, the others after operation. Two of the cases were of marked appendicitis, the others of typhlitis, with the formation of pericæcal purulent collections.

Kammerer [226 No.43] advises operation, both in acute primary cases as well as in relapses. Fluctuation is an indication for operation. Schmidt [3 Mar.16] believes, with Reclus, that many cases of apparent cure by medicinal treatment are not real and lasting. He reports two cases; in one the patient had been cured in a former attack, and apparently the same treatment was succeeding again, but sudden collapse occurred and the patient died. The other case was analogous, and he draws attention to the fact that these had been reported once as cures by medicinal treatment.

Wallis [370 B.54,No.6] concludes as follows, from three thousand and eighty-five cases under his observation in the Sabbatsberg hospital: (1) appendicitis produced 1.1 per cent. of the total mortality; (2) it was twice as fatal to men as to women; (3) the ages of greatest mortality were between 10 and 30 years (the average being 4.2 per cent.), while most cases occurred at these ages; (4) there were no cases in men over 45 years, or in women over 54 years; (5) the difference in results between these statistics and those of other hospitals, especially of Munich, show that it is impossible to draw conclusions from the statistics of one hospital regarding those of any other; (6) fatal cases of perityphlitis not due to appendicitis have no tendency to be more frequent in either sex or at any particular age.

Marchand [3 Mar.23] reports four cases of appendicitis with two deaths, recovery following once after medical and once after surgical treatment. He says that the lesions are the same in adults as in infants, being those of the cæcum, of the cellular tissue, of the peritoneum, and of the appendix. Nélaton [3 Mar.9] operated on a man of 34 years, who twelve years before had suffered from suppurative perityphlitis. In 1890 he had a relapse, for which he was treated by a colleague, who opened the collection of matter and inserted a drain. In a few months another relapse occurred, when Nélaton was called and treated the man again by incision and drainage. Three times subsequently in the space of a few months inflammation returned, and at the last return a fæcal mass came away from the wound, and since then the patient has done well.

The following have reported successful operations: Villar, of Bordeaux [188 Jan.19]; de Larabrie [127 Jan.12]; Rouville [7 May 6]; Villar [25 July]; Siraud [100 June]; Quénu [3 June22]; Kümmell [69 Mar.17]; Weiss [184 Nov.15,'91]; O. Gärtner [133 May 20]; Waitz [69 Apr.28]; Weydner [34 May 5,'91]; Anger [3 Feb.24]; Reynier [3 Mar.9]; Jalaguier [3 June 1]; Barling, of Birmingham [32 July]; Gillette, of Toledo [811 June]; Woolsey, of Oakland, Cal. [147 Nov.,'91]; Hartley [1 June 25]; White, of Philadelphia [112 Oct.]; Shepherd, of Montreal [282 Aug.]; Snyder [185 July]; Powell [109 Sept.]; T. G. Morton [19 Dec.19,'91]; Mayo Robson [6 Feb.13]; Morrow, of Cambridge [99 June 30]; Cale [850 Apr.]; Crofford [849 July]; Armstrong [282 June]; Iversen, of Copenhagen [373 No.6,'91]; McBurney [101 Mar.]; Jessop [2 Apr.9]; Ricketts, of Cincinnati, Ohio [1003 May]; Homans, of Boston [99 July 28]; Rogers, of Memphis, Tenn. [849 Jan.]; Moore [105 Jan.15]; Tiplady [6 Mar.5]; Page [2 Feb.20]; Barbat. [77 Sept.]

Briggs, [120 Nov.,'91] Kammerer [1 May 21]; Montgomery, of Philadelphia [144 July]; White, of Philadelphia [112 Apr.]; Brokaw, of St. Louis [109 Mar.]; Saunders [85 Mar.]; Wetmore, of Hampton, N. B. [284 Apr.]; Rogers, of Memphis, Tenn. [849 Jan.]; Kennedy, of San Antonio, Texas [1 Dec.5,'91]; Nichols, of Sacramento, Cal. [147 Feb.]; Barling [32 July]; and Gillette, [811 June] report cases upon which operation was performed for removal of the appendix, and death ensued.

The following authors have also contributed to the literature of this subject: E. A. Neely, of Memphis, Tenn. [849 Dec.,'91]; W. B. Deffenbaugh, of Paris, Arkansas [506 Mar.15]; A. Worcester, Waltham, Mass. [99 Aug.4]; F. H. Wiggin, [144 Aug.]; Thomas Jones, of Manchester [90 Jan.]; J. A. McGlenn, of Mt. Pleasant, Ohio [53 Sept.3]; J. M. T. Finney [104 Apr.9]; E. Fränkel, of Hamburg [34 Mar.1]; Thomas A. Ashby, of Baltimore, Md. [104 Dec.19,'91]; Baruch, of New York [59 Apr.30]; Lucas-Championnière, of Paris [3 June 8]; Terrillon, Terrier, and Routier. [3 June 11]

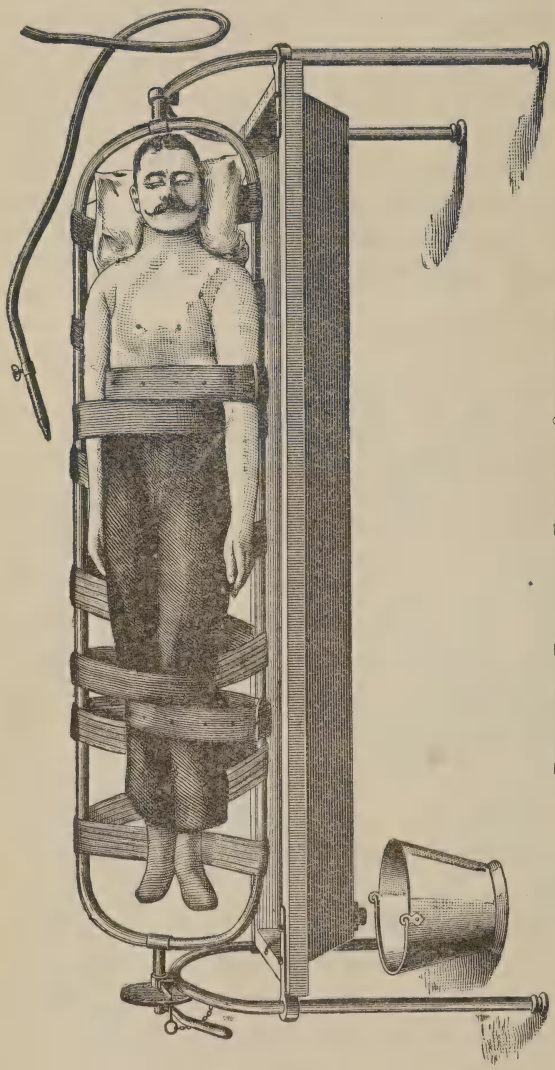
Intestinal Perforation in Typhoid Fever.—N. Senn [451 Apr.] records three cases: 1. An acute perforation, secured by Lembert's suture. Death followed shortly after the operation. 2. Perforation had taken place a week before the operation, and a large suppurating cavity was found with the perforation. Death followed a few days after the operation. 3. A boy, aged 14 years, ill for five weeks; abdominal distension and great pain led to the diagnosis of perforation or obstruction of the bowels. When the abdomen was opened, at least half a gallon of liquid fæcal matter and a quantity of gas was let out. No perforation could be found; Senn thinks it had become closed by adhesions. The cavity was washed and drained, and, at the time of writing, the boy was doing well.

NEW INSTRUMENTS, ETC.

Abdominal Drainage.—M. Price, of Philadelphia, [23 Mar.] considers that there is no other way whereby materials in the abdominal cavity are so perfectly under the control of the surgeon as when glass drainage is employed. W. E. Ashton [9 Feb. 20] recommends pads of absorbent gauze as a very convenient substitute for flat sponges in abdominal surgery. He considers that these pads present a number of advantages over sponges.

Clamps.—A. V. L. Brokaw [109 Oct., '90] has devised an intestinal clamp which resembles very much in its appearance a pair of spring fire-tongs. Its application is easy, and it has been frequently employed with advantage in intestinal work. H. W. Maunsell [5 Mar.] has also devised a new clamp. The advantages claimed are its extreme simplicity, its easy applicability, and its efficiency. The pressure can be regulated by the size of the sponge utilized. R. Martin Gil, of Malaga, Spain, [59 May 7] has devised two new clamps for use in surgery. One is composed of two concentric arcs or circles, the interruptions in which are about one-third of their complete circumference, and these openings permit of the introduction of pedicles of enormous size, notwithstanding the smallness of the instrument. The other is a more complicated apparatus, and intended for the removal of uterine growths. Baumgärtner, of Baden-Baden, [336 May 7] describes a new intestinal clamp, by which he can secure equal compression of the intestines. The compressing parts of the clamp are seven centimetres long and four and one-half millimetres wide. He tried the clamp

in a case of gastro-enterostomy, and found that it worked most successfully. Davy $^{6}_{\text{July 2}}$ has published a description of what he calls a revolving table for flushing operations. It consists of a strong steel frame, with broad canvas bands, on which the patient lies; this frame can be fixed at any angle, or detached for use as a stretcher. Underneath it is a long and wide japanned trough, which receives liquids and empties by a tap into a bucket. The canvas bands are very cheap, and may be destroyed when soiled. A. V. L. Brokaw, of St. Louis, Mo., $^{65}_{\text{Mar., '91}}$ and W. D. Haggard, Jr., of Nashville, Tennessee, $^{663}_{\text{May}}$ discuss some practical points in the technique of abdominal section. For the purpose of abdominal massage, Ivanoff $^{2}_{\text{Aug. 13}}$ proposes to substitute, for the metal spheres recommended by Sahli, hollow wooden or celluloid globes, into which shot may be introduced through a hole, which is then stoppered. The quantity of shot is proportioned to the weight required, according to the age of the patient. This method is thought by Ivanoff to be useful in atonic



Revolving Table for Flushing Operations. (*London Lancet.*)

constipation, in atony of the bladder, in some disorders of the womb, and in neuralgias of the limbs.

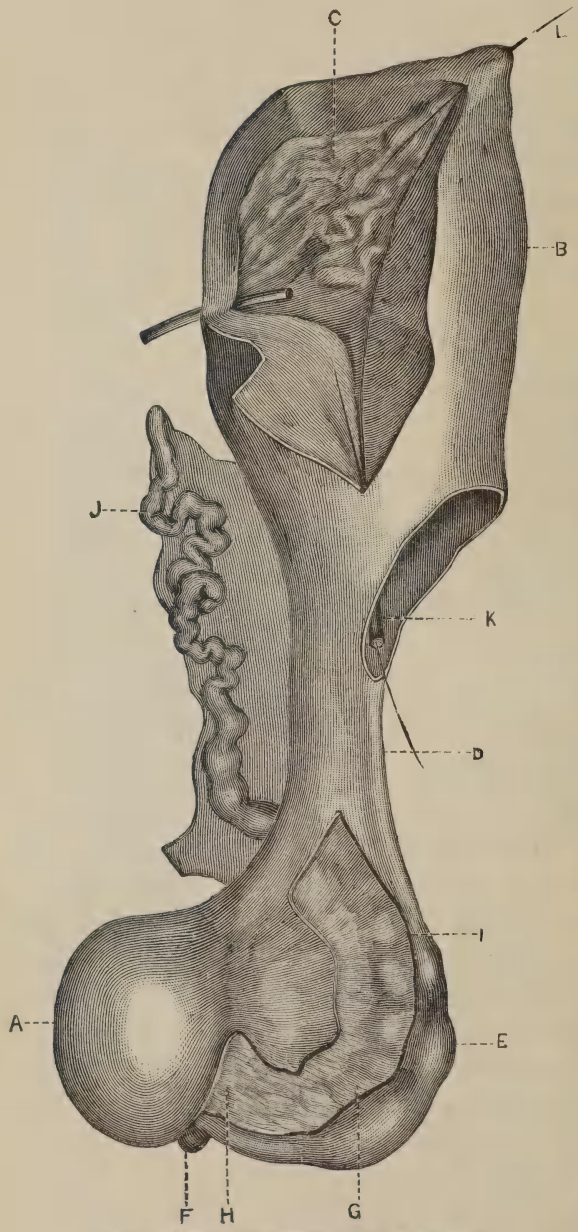
HERNIA.

The literature of this subject is, as usual, very voluminous; and it is not easy to arrange it in an altogether satisfactory sequence.

A remarkable but not unprecedented case is reported by Salmon, [100 p.1219] of a successful operation for the relief of a defective closure of the umbilical opening in a female child 1 day old. The liver, several loops of intestine, and some ascitic liquid, were contained in the protrusion, the walls of which were exceedingly thin. Chloroform was used. The operation was a very simple one, and by the fifteenth day union was complete, notwithstanding that suppuration had taken place about the two upper sutures.

A very extraordinary, if not unique, case is recorded by Boeckel. [168 Sept.1] A young priest, 20 years old, had been born with a hernia, for which he wore a truss until his fourth year. At 16, he had sudden severe pain in the left groin, and a tumor appeared; this was thought to be a hernia, and a truss was applied, but its pressure was often painful, and this became so severe that he sought relief. The right side of the scrotum was empty, and no trace of an undescended testis was found; on the other side the testicle was of twice the normal size. On opening the hernial sac, a mass was discovered and removed, which proved to be the right testicle, having attached to it, by a well-developed Fallopian tube, a *uterus*. This view was verified by Recklinghausen, whose anatomical description of the specimen is appended to the account. This would seem to be a unique instance of the inclusion of female genital organs in an otherwise well-developed male subject. (See cut on page 80.) Reference is made in a note to a case cited by Ahlfeld from Langer, of the finding in a male cadaver of "a sort of prostate, two vasa deferentia, two ovarian ligaments, two testes, each with an epididymis, all inclosed in a peritoneal fold like a broad ligament." Arbuthnot Lane [2 Mar.19] draws attention to the varying modes in which constriction acts on herniated bowel. He related two cases in which it was due to a sharp edge, by which the wall was divided, all but its peritoneal layer. Ordinarily the pressure is such as to interfere with the return of blood, and gangrene is apt to ensue at the convexity of the loop.

The occurrence of tubercle in hernial sacs has lately attracted some attention. According to Bruns [336 July 30; 3 Sept.21] there are only twelve cases on record, to which he adds another in a man aged 52. Two more, one in a man aged 27 and the other in a boy aged 6, have been put upon record by Southam. [90 Apr.] In two others, reported by Remedi, [336 Apr.16] there was tuberculous peritonitis; in one of them the apex of one lung was also infiltrated. Such deposits, it would seem, may occur either primarily or by extension from the general peritoneum.



EXTIRPATION OF UTERUS AND ANNEXES.

A, testicle; B, uterus; C, uterine mucosa: D, broad ligament; E, Fallopian tube; F, Morgagnian hydatid; G, epididymis; H, vessels of testis; I, glands of tail of epididymis; J, vas deferens; K, canal of Fallopian tube entering the left cornu of uterus; L, canal of right extremity of uterus.

(*Gazette Médicale de Strasbourg.*)

The tendency of opinion is more and more strongly against persistency in attempts at taxis in cases of strangulated hernia, of whatever form. It is true that in exceptional cases good results are obtained under very unfavorable circumstances. Thus, Hirsh, of Philadelphia, [19 Apr.9]

reports an instance in which a man, aged 47, had had for six years an irreducible hernia, which became strangulated; this condition lasted three days and fæcal vomiting had set in, but operation was refused. Irrigation with the long rectal tube, carminatives, and active saline purging, with ice to the tumor, were used for a week; then massage was employed for half an hour daily for three weeks, at the end of which time all the symptoms had disappeared, and the patient returned to work wearing a truss. A success like this might be the indirect cause of the loss of many lives. Mr. Bennett, $\frac{6}{\text{Aug. 20}}$ in a clinical lecture, discusses the difficulties and dangers attending such manipulations. Bruising of the bowel, complete or incomplete rupture of its wall, laceration of adhesions, rupture of the sac, hæmatocele (in cases complicated with hydrocele), hæmatoma of the scrotum, or reduction without relief to the strangulation,—one or more of these ill conseqences may ensue. He urges that efforts at taxis should not be continued for more than five minutes; that they should be made with warm hands, one firmly supporting the neck of the tumor while the other manipulates its body or lower part, the pads of the fingers and not the tips being used. When the true expansile impulse on coughing is noted in the non-sensitive and non-inflamed tumor, and in recent cases of strangulation, in which there is no extreme tension, the taxis may thus be employed with safety. Difficulty in reduction may depend upon folds of the lining membrane of the sac, even after free division of the apparent constriction by the knife. Bennett also points out that rupture of the protruded bowel is more apt to occur at its most prominent part than at the constricted portion. In another lecture $\frac{6}{\text{Dec. 19, '91}}$ the same surgeon discusses the occasionally deceptive nature of the symptoms of strangulation, giving in illustration three cases. One of the great advantages secured by the antiseptic system is the safety with which operations may be resorted to; so that it is almost an absolute rule—"when in doubt, operate."

De Garmo, of New York, $\frac{462}{\text{Sept.}}$ takes somewhat the same ground as to the taxis, but less decidedly. For its performance he thinks it better to place the patient on a table, so slanted as to raise the hips; to crowd the abdominal contents toward the chest; to apply one hand to the neck of the tumor and the other to its body, and to draw it down so as to lengthen it out, at the same time com-

pressing it. Of course, such a manœuvre rudely executed would endanger the bowel; the utmost gentleness is essential.

A Western surgeon [192 Mar.] recommends a "method" which, he says, he has found very effective. "Grasp the tumor tightly with fingers and thumbs, between the tumor and body; then lift up strongly. This repeated a few times has never failed in my hands." Worse advice could hardly be given. Another plan is proposed by Del Valle [996 Aug.10]: to push up the middle finger, invaginating the upper two-thirds of the scrotum into the ring, and to try by force to distend this latter so as to make the passage through it wide enough for the return of the bowel. Should the ring be too resistant for this, he passes up on the finger a probe-pointed bistoury, forces it through and divides the constriction. Squire, of Worthington, Ind., [199 Sept.] revives an old idea: of making suction on the abdominal wall by applying a large bowl in the manner of a cupping-glass. He says he has found it necessary to resort to it frequently in his thirty-five years of practice.

Perhaps it is hardly needful to suggest that by either of these three "methods" the bowel might sustain fatal damage, even in a hernia of very recent origin. In a case recorded by Albert, [8 Sept.8] a woman, aged 53, had a small femoral rupture which had repeatedly been strangulated, but always easily reduced; the trouble recurred, but was relieved within an hour, the bowel returning readily and with a gurgling sound; pain was felt on the instant, symptoms of peritonitis ensued, and an exploratory herniotomy was performed, when a rupture of the bowel was found and sutured with success.

Reference may be made here to a somewhat similar case from von Mosetig's clinic, reported by Zerner. [8 Jan.21] A woman, aged 43 years, with an incarcerated femoral hernia, was operated on, and when the adhesions were separated a large quantity of pure pus flowed from the abdominal cavity. The incision being enlarged, a gangrenous spot was found; a glass drainage-tube was inserted, and the peritoneum washed out with 2-per-cent. solution of salicylic acid; the bowel was then fastened in the opening and an artificial anus established, which was afterward dealt with in the usual way, with a good result.

Spontaneous or non-traumatic ruptures of hernial sacs are discussed by Albert. [57 Jan.3; 22 Feb.3] He mentions three cases: one of femoral and two of umbilical herniæ. The lesion seemed, in each,

to be the result of slow and long-continued inflammatory changes of a low grade, and the resulting fistulæ would close and reopen repeatedly.

An interesting case is recorded by Euthyboule $\frac{87}{\text{May}}$ of a woman, aged 75 years, who, twenty-five years before, had been gored by an ox, the wall of the abdomen having been torn and the intestines prolapsed. Healing of the skin had taken place, but the deeper layers of the wall remained ununited, and a mass of small intestine was contained in a tumor about as large as a child's head. Reduction was easy, and the fingers could be carried in so as to feel the posterior wall of the abdomen. An operation for the closure of the defect was refused by the patient.

Broca $\frac{7}{\text{Feb.26}}$ calls attention to the occasional occurrence of permanency of remains of the peritoneo-vaginal canal, in the shape of long serous sacs, closed or otherwise, lying parallel to that inclosing the hernia. Such a condition might be a source of perplexity to an inexperienced operator.

Southam $\frac{6}{\text{Nov.28,'91}}$ publishes statistics of eighty-five cases of strangulated hernia operated on at the Manchester Royal Infirmary, with the following results:—

	No. of Cases.	Recovered.	Died.	Mortality.
Femoral, . .	37	22	15	40 5 per cent.
Inguinal, . .	36	22	14	38.8 "
Umbilical, . .	12	3	9	75.0 "
Totals, . .	85	47	38	44.7 "

This mortality, which seems at first rather high, is said by Southam to be not much above the average in other large institutions, which varies from thirty-two to forty-six. He attributes it to two causes: (1) the delay in applying for surgical treatment; (2) the injury inflicted in attempts at taxis.

Morison $\frac{32}{\text{Sept.}}$ offers some results of an exceptionally large experience in strangulated hernia for three years at the Royal Infirmary, Newcastle-on-Tyne. He thinks that the disorder is too frequently unrecognized; the patient insisting that the hernia is always down, and has nothing to do with the symptoms; or the attendant regarding the tumor as either an undescended testis or an inflamed gland. The symptoms may be masked by opium, by idiosyncrasy, or by gangrene; either of these inducing a false calm. Or there may be no palpable tumor; in such cases, the

other signs being present, a careful inquiry into the history of the case may develop the fact that a tumor has, at some previous time, existed, and this should put the surgeon on his guard. Morison advocates putting the patient in a hot pack, with ice over the hernia, and giving ½ grain of morphia by suppository. If, after three hours, a gentle attempt at taxis fails, herniotomy should be resorted to at once. He urges that when the operation is performed the sac should always be opened.

The same surgeon says that he has met with three cases in which the symptoms of strangulation occurred, and the sac when opened was found to contain omentum only. Another such case, in which there was a double sac, is reported by Stevenson [22 Jan.27] as having been treated at St. Mary's Hospital, London, by A. T. Norton. Bennett [6 Dec.19,'91] gives still another instance. A case of hernia, complicated by undescended testicle, successfully treated after the removal of the latter, is reported by Cornell. [192 Aug.] Another, in which a ball-like wad of omentum, probably left behind at the time of reduction of a hernia six years previously, had been much irritated by the pressure of a truss, is put on record by Dunn, of Minneapolis. [105 Mar.15]

Inguinal Hernia.—As a matter of history, Macready [2 Mar.26] quotes from Méry, a French surgeon, an account of a case of hernia in a man 70 years of age, operated on by him, which closely corresponds to that to which Hey gave the name "infantile hernia." But priority can hardly be claimed for the French surgeon, as is hinted by Macready, since he simply described his case, but made no attempt to interpret it. From Hey's account, now before me, it is clear that he recognized the full significance of the condition. Stern, of Düsseldorf, [336 Jan.16] reports a successful operation for incarcerated inguinal hernia in a male child only 3 weeks old. In another case of the same kind, that of a boy 9 months old, of weakly habit, the symptoms had existed for three days, and death ensued on the fourth day after the operation. In both the hernial sac was isolated, tied at two points, and divided between, the pillars of the ring being then sutured together with strong catgut.

Two cases of strangulated inguinal hernia, requiring operation, in male children aged respectively 3 months and 1 year, are reported by Platt, of Baltimore. [764 June] Both did well.

Ward Cousins [6 May 7] is reported to have operated by abdominal

section, in the case of a man aged 51 years, for a hernia strangulated in the upper part of the inguinal canal. The man was suffering from obstruction and peritonitis, with collapse; the gut was easily freed, but the peritonitis proved fatal at the end of three days.

Two very instructive cases are reported by Moore, of Melbourne. [285 Nov.,'91] In the first a man aged 25 years had suddenly developed a large right inguino-scrotal hernia, irreducible, painful, tense, and without impulse on coughing. It was opened, a constriction at the external ring and another at the internal ring divided, and an intensely congested knuckle of bowel returned. A mass of omentum which could not be returned was tied with carbolized silk, cut off, and the stump pushed back into the abdomen. Healing took place by first intention, but six weeks later the man returned, with a tender, rounded swelling in the median line below the umbilicus; this was opened and a quantity of thick pus evacuated, after which recovery was prompt. Although the ligature was not found, it seemed probable that it had been the cause of infection and of adhesion of the stump to the abdominal wall.

In the second case, a man aged 49 had worn a truss for an inguinal hernia for years; two days before admission it came down, could not be returned, and symptoms of strangulation ensued. After a warm bath and the application of ice reduction was easily effected, but the symptoms continued. Next morning, the hernia seeming to be only imperfectly reduced, an operation was performed; a large quantity of liquid, with congested intestine and omentum, was found in the sac; a diverticulum of the sac, with some bowel and some omentum, had been returned on the previous day. All the bowel and a part of the omentum could now be reduced; a large portion of the omentum was removed. Recovery took place quickly, in spite of a troublesome cough. A somewhat similar instance is recorded by Dubar, of Lille. [10 Apr.26] The diverticulum was lateral, and strangulation took place at the orifice of communication; the protrusion was behind the cord. The patient, a man aged 68, had an uneventful convalescence after the operation.

A case in which only a part of the knuckle of bowel was nipped (Richter's hernia) by a sort of supplementary sac, which was connected by a fibrous band with the upper edge of the tunica

vaginalis, is reported as having occurred under the care of E. Owen, of Manchester. [22 Nov.25,'91] There was also a hydrocele of the cord. The funicular process was drawn down, tied with a silk ligature as high as possible, and the hour-glass sac below was cut away. A good recovery ensued.

A case of strangulated congenital inguinal hernia is reported by Duret and Guermonprez. [220 May 13] The patient, a man aged 33, had never worn a truss. At the outer part of the sac, in a sort of pouch like a rudimentary tunica vaginalis, lay the testicle, of smaller size than normal. It was removed, since it has been shown by Monod and Terrillon that such organs are liable to sarcomatous or cancerous degeneration. Bennett [22 Mar.16] found in a very large scrotal hernia, in a man aged 68, an obstacle to reduction in a twist of one portion of the intestine, which lay tightly over the remainder; on straightening this, reduction was easy.

Kitto, of Racine, [61 Mar.12] publishes an account of the case of a man, aged 76, with complete hemiplegia, who, in a fit of sneezing, had a protrusion of gut into the scrotum, quickly followed by symptoms of strangulation. On the third day an operation was performed; the incision required was nine inches in length; three inches of gangrenous intestine were removed, and the ends sutured together. The man did well for two weeks, when hypostatic pneumonia set in, and proved fatal on the eighteenth day.

A successful operation performed on a patient in a state of collapse, the bowel being found black and lustreless, is recorded by Van Schaick, of New York. [101 Mar.] Cases in which the application of sulphuric ether locally (about 2 fluidrachms every ten or fifteen minutes for several hours) rendered the taxis easy are reported by Marinescu, [996 Dec.,'91] by Fenn, of California, [61 Apr.16] and by Ettinger. [214 July 15] In the three cases reported by Ettinger, as in Fenn's, the hernia was incarcerated.

Depage, of Brussels, [868 Jan.2] reports the case of a man, aged 24 years, who, until the age of 18, had had an undescended left testicle, and since that time a reducible hernia, both testicle and hernia passing back into the abdomen when he lay upon his back. The hernia becoming strangulated, a surgeon reduced it, but without relieving the constriction, and fæcal vomiting ensued. On opening the abdomen by a large median incision, a tumor as large as the fist was discovered, consisting of intestine engaged in an orifice in

the tunica vaginalis. This orifice was closed by suture, and the testicle brought down into the inguinal canal. Three weeks after the operation the gland was found in its proper place in the scrotum, and the hernia had ceased to exist.

Five cases are recorded by Lucas-Championnière, [3 Feb.17] in which abdominal section was rendered necessary by internal strangulation of intestine after herniotomy. In one instance the operation was a double one, the wall being opened first laterally and then in the median line. In all the results were favorable.

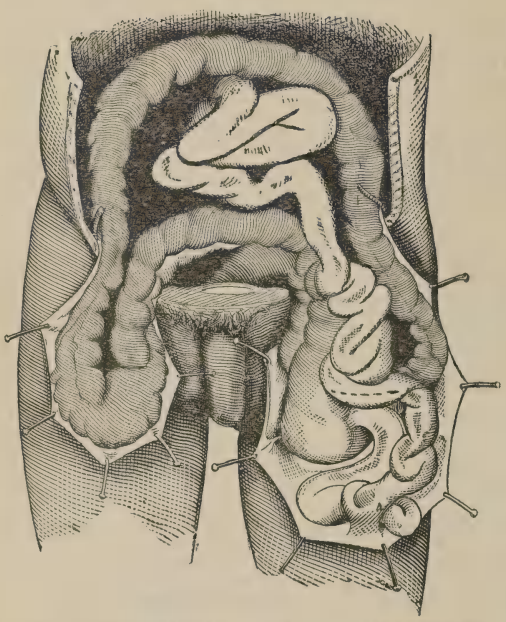
Cæcal Hernia.—The anatomical relations of the cæcum and their influence on its herniation have been studied by Hildebrand. [13 July 15] This author thinks the cæcum can hardly be herniated except under abnormal conditions, which may be either congenital or acquired. Thus, there may be persistence of the fœtal state of the gut; anomalies of its attachment, such as a long mesentery or ligament; adhesions to other organs, as the testis, etc. Of acquired abnormalities, there may be inflammatory swellings or adhesions to the testis or to other organs; the peritoneum itself may draw the gut downward. The author has collected one hundred and twenty-eight cases of this lesion, the great majority being right inguinal, and about one-quarter as many left inguinal; the numbers of the right femoral, umbilical, and ventral are about equal, and one was ischiatic.

Reference may be made here to another paper, by Duret, of Lille, [220] on the subject of cæcal hernia generally. In an appendix a case is reported by Franchomme, cured by hernio-laparotomy, which Duret regards as the most suitable operation to be adopted in such cases. Gangolphe, [211 Jan.17] in an article on this subject, records an instance of hernia of the cæcum complicated with inflammation of the appendix. He regards the localization of the inflammation in the hernial tumor, the occurrence of fetid suppuration without the issue of gas or of fæcal matter, and without serious interference with the intestinal functions, as perhaps diagnostic signs of this lesion.

In an instance reported by Broca, [7 Oct.9,'91] there was a double inguinal hernia; that on the right side contained merely a loop of the colon; while the left one, much larger, inclosed not only the sigmoid flexure, but also the cæcum, several inches of the ascending colon, and a very long loop of the ileum, the lower part

of this loop being connected by fibrous adhesions with the fundus of the sac. On the posterior inner surface of the sac there was a transverse, valve-like fold of the serous lining, upon which the cæcum rested. The specimen (see cut) was taken from an aged male subject in the dissecting-room.

Menocal [996 Feb.10] met with a case of strangulated right inguino-scrotal hernia, in a man aged 40 years, in which, with a large amount of liquid, there was found the cæcum and vermiform appendix. This latter, with the testis, was removed, and the patient recovered completely in fifteen days. A case in which the vermiform appendix by itself was contained in the sac of an inguinal hernia, became strangulated, and was removed by operation, is reported by Thiéry. [7 July 1]



Bilateral Inguinal Hernia, including Epiploön, Transverse Colon, Small Intestine, the Cæcum, and the Sigmoid Flexure.
(*Bulletin de la Société Anatomique.*)

It may be of historical interest to recall that, in the case observed by Hey in 1764, and upon which he based the term "infantile hernia," the subject was a child 15 months old, and the sac contained the cæcum and the root of the appendix, the rest of the latter being still in the abdomen.

Femoral Hernia.—Moulonguet [230 Aug.] has reported the case of a woman, aged 76, who had long suffered from chronic enteritis, and who had a reducible crural hernia, which suddenly became strangulated. The taxis failing, and the symptoms becoming urgent after eight and one-half hours, an operation was performed, and a small loop of intestine found in the sac; it was almost empty, soft, black, and flaccid. So tense was the constriction that it had to be divided from without inward, with the utmost caution. The patient did well for four days, but was then

seized with diarrhœa, which proved fatal on the fifth day. There was no evidence either of local inflammation or of peritonitis.

In a case reported by Gamble, of Iowa, [820 June] the patient, a woman, was in a desperate condition, and when the sac was exposed it was thought to be gangrenous; it was tapped, and then the division of Gimbernat's ligament was accomplished and some old adhesions were broken up. The circulation returning, "the sac and its contents" were pushed back, and the ring was closed with three silk sutures. A good recovery ensued. In another instance, reported by G. F. Lydston, of New Orleans, [12 May] the strangulation had lasted ten days; the bowel was deeply congested, but the circulation returned, and it was put back. Death ensued four hours later, and is ascribed by the reporter to the continued strangulation of another knuckle of gut previously reduced.

Keen [451 Feb.] reports a case of Littré's hernia, the bowel being partially nipped in the right femoral ring, in a very thin woman aged 60. There were symptoms of obstruction, but no hernia could be detected until, after a median abdominal section, the hand was introduced into the belly. The liberation of the gut was then effected by traction from within and pressure from without. Recovery ensued. Cases of femoral hernia requiring operation, but containing omentum only, are recorded by Allingham, [22 June 22] and by Reeves. [2 June 18] Another instance, observed in the dissecting-room, is reported by Montgomery, of San Francisco. [109 Mar.] Bennett [6 Dec. 19, '91] reports the case of a woman, aged 53, who had what was supposed to be an inflammation of glands in Scarpa's space. On exploration, it was found to be a right femoral hernia, containing only the vermiform appendix, gangrenous and very tightly pinched at the femoral ring. The stricture was divided, the cæcum drawn down, and the appendix cut off through its healthy portion; the peritoneal surfaces were inverted and fastened with three Lembert sutures. A rapid recovery followed. Zuccarelli [46 Apr. 15] reports the case of a woman, aged 49, who had had a crural hernia on the right side for eleven years; six days before her admission to the Hôtel-Dieu, at Marseilles, it had become strangulated. On operation fæcal liquid escaped from the sac, which contained a coil of jejunum and the appendix vermiformis; the latter adhered by its tip to the fundus of the sac, and had, near this point, a perforation, about three-fourths of its circumference having given way. A

portion of the cæcum was also sphacelated, and was resected with the appendix. Twelve days after the operation a cerebral hæmorrhage occurred, and proved fatal in forty-eight hours. An autopsy showed no peritonitis and the parts concerned in the hernia in good condition.

In a case reported by Shepherd, [282 Apr.] a woman aged 53 was operated on for strangulated femoral hernia, and two months afterward had marked symptoms of chronic obstruction. Two months later a median incision was made, and the bowel at the seat of the hernia was felt to be imbedded in a mass of cicatricial tissue; a lateral incision was then made, and the anterior wall of the gut was found to be contracted so that the lumen was not larger than a lead-pencil; about three inches were resected. The patient recovered perfectly, in spite of a severe attack of bronchitis.

A somewhat curious case is recorded by Haslam. [2 Mar.26] A woman 35 years old had, after confinement, a large abscess, which was opened in the right groin, and complete healing took place. A few years later she had a hernia, which gave her more or less trouble until, when 47 years old, she had symptoms indicating its strangulation. The swelling was found to be below Poupart's ligament, and fully an inch *external to the artery;* its walls were very thin, and it contained a congested knuckle of small intestine. A good recovery ensued.

Umbilical and Ventral Hernia.—Sympson [2 May 7] relates the case of a very stout married woman, aged 48, who had a strangulated umbilical hernia, the skin over which was sloughing as the result of very hot fomentations. An operation was performed and a knuckle of bowel returned; but the symptoms continuing, the sac was freely opened up again and its omental contents removed, when a tense band was found stretched from a point two inches above the umbilicus to the margin of the ring; beneath this band a knuckle of intestine was tightly constricted. On the division of this and the closure of the wound, the symptoms disappeared. Recovery ensued, although retarded by a severe attack of diarrhœa and by abscesses in the abdominal walls.

Southam [6 Nov.28,'91] reports that among eighty-five cases of strangulated hernia in his hospital practice twelve were umbilical; all the patients were women, seven being between 30 and 50 years of age and five between 50 and 70. No less than nine cases

terminated fatally; in nine the bowel was sufficiently healthy to be returned; in three, all fatal, portions of gangrenous intestine were resected, the ends of the bowel being brought together in two cases by sutures, in one by means of Senn's plates.

A successful operation for strangulated umbilical hernia is reported by Mayorga. $^{542}_{July}$ The patient was a woman aged 40 years. Another, in a case of irreducible omental protrusion, in a woman 26 years of age, is given by Clara S. Eirley. $^{104}_{Sept.3}$ The sac had suppurated and opened, and a large portion of the protruded omentum was sphacelated.

Birmingham, U. S. A., reports $^{1}_{May\ 26}$ a case in which an old omental protrusion at the umbilicus had assumed the characters of a lipoma. In removing it, a quantity of intestine escaped through the abdominal wall. The opening in the peritoneum was closed with a "purse-string" suture, which came away on the twenty-fifth day. At the time of the report there was promise of a permanent cure.

Mention may be appropriately made here of a case reported by Shepherd, of Montreal, $^{282}_{Jan.}$ in which a male infant, aged 3 months, had a projection about an inch long at the umbilicus, red and moist, and with an opening at its extremity through which liquid fæces escaped. An abdominal section was performed, and it was found that a diverticulum from the ileum had remained patent in the cord, and had been cut off by the ligature. The root of this diverticulum was removed, and the opening in the bowel was closed by a double row of Lembert sutures; the case did well.

Mauny (de Saintes) $^{3}_{Apr.20}$ met with a case of voluminous subumbilical hernia, in a woman 67 years old, strangulation having existed for forty-eight hours. A mass of omentum weighing 600 grammes (over 19 ounces), and another of intestine, the two being adherent to each other at many points, were found; the intestine showed several areas of gangrene. Free bleeding took place from a tear of the gut. Enterorrhaphy was performed, the wound was closed, and recovery ensued.

Under this head may be mentioned a case reported by Thiéry, $^{7}_{June}$ in which a woman, aged 33, had had for five years severe pain at a point to the right of the navel, where there was a lump somewhat larger than a pea. On operation there was found

an elliptical opening between the fibres of the external oblique tendon, through which a small portion of omentum protruded; a mass of this was drawn out and removed, after which the edges of the orifice were brought together by five points of a Czerny suture made with silk, and the wound was closed. Recovery was uneventful, but it remained to be seen how far the relief was permanent. Cases of ventral hernia following cœliotomy, and treated with success by plastic operations, are reported by Dunning, of Indianapolis, [61 Feb.13] and by Charlotte B. Brown, of San Francisco. [147 Apr.]

Irregular Forms of Hernia.—Anderson, of Nottingham, reports [6 Apr.2] an interesting case in which a femoral and an obturator hernia were co-existent. The patient, a woman aged 75, had for many years had a lump in her left groin. This suddenly increased in size and became painful; there was also vomiting and constipation, although some flatus could be passed. An operation was performed two days later, and there was found a femoral epiplocele, which was reduced. The symptoms continuing, an abdominal section was made, and a small knuckle of intestine was found tightly nipped in the left obturator foramen; the whole circumference of the gut had not been included; the pressure had, however, produced gangrene, and rupture of the bowel occurred as it was withdrawn. Resection of the sphacelated part was at once performed, the divided ends being joined by a Lembert suture. The patient never rallied, but died in a few hours.

The co-existence of an inguinal and a femoral hernia on the same side is the subject of a communication by Berger. [152 Mar.4] This author bases his statements upon the observation of 10,000 cases of hernia, among which he saw the condition above mentioned 225 times in male subjects, 20 or 25 times in females. It would at first seem curious that the simultaneous presence of an inguinal hernia on one side and of a femoral on the other should have been met with only 111 times in males and 70 times in women. But, as the author points out, the former condition is the result of mere relaxation from debility. The inguinal hernia is almost as often direct as oblique; all the tissues concerned are stretched and loosened, and, in fact, the phenomenon is allied to *eventration*. Strangulation is very unlikely to occur. The only treatment is retention by means of a truss, the fitting of which is very difficult. Radical cure is out of the question altogether.

On the important subject of *properitoneal* hernia—called also interstitial, intra-parietal, or sometimes parietal hernia—there have been several publications. Keen [451 Feb.] reports the case of a man, aged 23, who had had for many years a right inguinal hernia, which suddenly became painful during an attack of vomiting, and a sausage-shaped tumor developed, extending from just within the mid-point of Poupart's ligament to the bottom of the scrotum. Two days later he was admitted, very ill, at St. Agnes' Hospital. An operation was at once performed; the sac, being opened, was found to contain omentum and a small loop of intestine; the omentum was tied in four parts and removed. Reduction could now be performed, but against some resistance, and the bowel always came down again on the removal of the finger. The incision was now extended outward, and the exploring finger passed into a smooth-walled cavity in the iliac fossa; the opening from this into the abdominal cavity, corresponding to the internal ring, was stretched, and the bowel easily reduced. Death ensued eight hours later. No autopsy could be obtained.

Braun, of Leipzig, [336 Jan. 9] records another instance in a man, aged 33 years, who had for eight years a left scrotal hernia, which had been several times strangulated, but always reduced by taxis. About three weeks after the last occasion of this kind he had sudden pain and vomiting, and next day applied at von Volkmann's clinic. He was collapsed, with a temperature of 38.5° C. (101.3° F.). No hernial tumor was present; the left canal was empty and large, but the finger introduced into it encountered a resistant substance, and there was, above Poupart's ligament, a swelling, slightly movable, firm, and tender. On operation the canal was found empty, and there was no trace of a sac; behind the internal ring, which was in its normal place, there was felt a tight, elastic swelling. The incision was prolonged, and a sac containing a loop of small intestine and a quantity of bloody serum was opened. It lay between the abdominal wall and the peritoneum, and its orifice was directed upward, outward, and backward. This sac was tied and cut away. The patient recovered.

A case much like this, in a man aged 54 years, is recorded by Poulsen, of Copenhagen. [673 Aug.] Death ensued some hours after the operation, in consequence, it is suggested, of the handling of the intestines. Another very similar case is reported by Brenner,

of Linz,[336 Mar.26]; but the properitoneal hernia was on the left side, while the pain and tenderness were on the right, and here the exploratory incision was first made. The patient, a man aged 25 years, did well. Link, of Lemberg,[336 Jan.30] gives the details of a case which he thinks supports the view held by Schmidt, of Cuxhaven, that the testicle and cord are not concerned in the development of these properitoneal sacs, as maintained by von Bramann. Schmidt,[336 Feb.20] however, comments upon this report, and says, very justly, that the case was not one of properitoneal hernia at all, but what he would call "interstitial scrotal." [I must confess my inability to understand why it should be called anything except an oblique inguinal hernia, strictured at both the external and internal rings.—Ed.]

A case of *obturator* hernia, observed by Picqué, is further referred to by Berger.[3 Dec.9,'91] The patient, a woman aged 78 years, after several attacks of incomplete obstruction, presented symptoms of strangulation, supposed to be at the femoral ring, and an operation was begun; but no sooner was the skin divided than the tumor receded; a vaginal examination showed its true nature. Some time afterward, another attack occurring, it was thought proper to wait, but pulmonary symptoms came on and proved fatal. At the autopsy the hernia was found to contain a loop of intestine and the Fallopian tube. Berger discusses the points of diagnosis in these cases: The swelling is apt to be diffuse, not circumscribed; the seat of tenderness is different from that in femoral herniæ; there is no pedicle to the tumor; examination by the vagina may throw light on the nature of the case; and, finally, too much reliance must not be placed on the presence or absence of symptoms of pressure on the obturator nerve. As there are no other means of retaining these herniæ, an attempt at their radical cure should always be made. Laparotomy can only be suitable in exceptional cases.

Ischiatic hernia has been discussed by Garré, of Tubingen,[13 July 15] apropos of a specimen of that lesion examined by him, and of ten recorded cases. He would restrict this term to protrusions taking place through the lesser sciatic notch, those through the greater being called *gluteal*. It may occur on either side, and may be either congenital or acquired. It has been seen more often in females. Its contents may be bowel, ovary, or a diverticulum of the bladder. Incarceration of a portion of bowel along with an ovary has been observed in three cases.

Another article on the same subject, by Langer, [8 Aug.25] contains a report of the case of a woman, aged 41 years, who had symptoms of obstruction; a hernial tumor in the left femoral region was opened, and a lipoma connected by a fibrous stem with a loop of large intestine was found; the lipoma was removed and the bowel returned. The symptoms persisting, a median abdominal section was done, and a loop of the ileum found in the greater sciatic notch. Relief followed; but on the fifth day the patient died with pulmonic symptoms, probably from embolism.

In a case reported by Schwab and Monbouyran, [7 Mar.18] a woman, aged 31 years, had a large fibrolipoma excised from the right buttock; at its base of attachment were found two hernial sacs emerging through the greater sciatic notch; one of them was above the pyramidalis muscle, and contained a loop of small intestine; the other, empty and with thick walls, was below the muscle.

Petit, of Bordeaux, [188 Feb.7] publishes an account of a man, aged 43 years, who was the subject of a *lumbar* hernia, apparently the result of an accident at 2 years of age. From the account it would seem that there was injury to the lower dorsal and lumbar vertebræ, followed by caries, and by an abscess opening in the loin (on which side is not stated); and that the degeneration of the quadratus muscle permitted the hernia to develop in the triangle of Petit. In the loin there was a long, irregular cicatrix, and below this the tumor, which could be easily reduced, and three fingers pushed after it into the hernial ring.

A remarkable case of hernia *into the foramen of Winslow* is reported by A. Neve, of Srinagar, Kashmir. [6 May 28] The patient, a Mohammedan boy aged 17 years, came under observation on the seventh day of an intestinal obstruction, and was closely watched for twenty days, intussusception being suspected. An abdominal section was then performed, and the nature of the trouble determined, although reduction could not be effected. Forty-eight hours later, after a large enema, the symptoms subsided, and a rapid and complete convalescence set in. Of course, the chief interest in this case lies in the facts (1) that the nature of the hernia was revealed by the exploratory operation, and (2) that recovery ensued. In one other like instance, reported by Treves in 1888, a fatal result took place. In the four other cases on

record, referred to by Treves, the nature of the lesion was only determined upon post-mortem examination.

Makara, of Budapest, [41 Sept.1] reports a case of *internal* hernia, a loop of intestine being caught in a sac apparently formed of the mesentery of the ileum. The patient, a woman aged 45 years, who had had for four years double inguinal herniæ, was relieved by means of an abdominal section.

Another case of internal strangulated hernia, which resulted fatally, is recorded by Rees, of Toledo, Ohio. [779 Mar.] The subject was a man, aged 21 years, who had been ill for three weeks with constipation and peritonitis. Two weeks after his admission to hospital, his condition being desperate, the abdomen was opened, but the adhesions of the intestine in the left iliac fossa could not be overcome; the man died on the table. An autopsy showed extensive adhesions at various points; the left iliac fossa had been partitioned off into a cavity, two knuckles of intestine being entangled and projecting into it; they had been so tightly nipped as to become gangrenous. One cannot but think that the interference, if instituted two weeks earlier, might have had a more fortunate result.

A number of instances of *diaphragmatic* hernia, all fatal, are recorded. Larsen, of Denmark, [673 Aug.] reports a congenital case, the stomach, small intestine, ascending and transverse colon, omentum, spleen, and larger part of left lobe of liver having passed through a wide opening in the diaphragm, into the left pleural cavity; the heart was displaced to the right. The child breathed imperfectly for about twenty minutes. Mendez [1050 May] publishes an account of a man, aged 32 years, who was stabbed in the seventh intercostal space, midway between the parasternal and the axillary lines; six months afterward he was attacked with symptoms of intestinal obstruction and marked dyspnœa. He died in about sixty hours, the diagnosis of diaphragmatic hernia having been made. An autopsy showed that the great omentum and transverse colon had passed into the left thorax through a small opening in the left side of the cordiform tendon.

Knoll and Leclerc [243 Apr.] record the case of a soldier, aged 18 years, for several years subject to pains in the stomach, who was attacked with violent colic and dyspnœa and died in six hours. At the autopsy the stomach, great omentum, and part of the colon

were found to have been forced into the left pleural cavity through an oval opening, four centimetres by six, in the left side of the cordiform tendon. In a case reported by Niemöller, [2 June 4] a man, aged 35 years, died after suffering for six months from nausea, vomiting, and other symptoms, ascribed to gastric catarrh and dilatation; the pyloric portion of the stomach was found herniated through the tendon of the diaphragm. Currier, of Newport, Vermont, [19 Mar. 5] reports an autopsy upon a man, aged 67 years, who had been for nineteen years subject to colic and dyspnœa, the first attack having followed a violent fit of vomiting. He died after an illness of five or six days, with vomiting and obstinate constipation. Through an opening in the diaphragm extending from the mediastinum five inches to the right the caput coli, a loop of transverse and descending colon, and a mass of omentum had passed; the loop of colon was distended with gas and highly inflamed. The appendix vermiformis was seven inches long and one-fourth inch in diameter.

Justo [1050 May] has recorded a case of hernial protrusion of a pouch of the *urinary bladder* through the gap left in the abdominal wall by a tearing away of the lower attachment of the right rectus muscle seven years previously. Along with this there would seem to have been an inguinal hernia on the right side, which was successfully reduced; but a tumor remaining, it was cut down upon, a portion of the herniated bladder was resected, and the wound closed. A complete recovery ensued.

Treatment of Gangrenous Intestine in Strangulated Hernia.—Upon this subject there have been published within the past year several articles of value, and its extreme importance seems to me to warrant noticing them under a special heading.

Mikulicz [13 May] has collected one hundred and sixty-eight cases from the practice of seven operators, in which either resection of the gut or the establishment of an artificial anus was adopted. From these it would appear that the results of the former course (a mortality of 47.1 per cent.) are far more favorable than those of the latter (76.6 per cent.). A direct comparison of the results of the two methods is, however, hardly reliable, since the chief adherents of resection—Kocher, Hagedorn, Mikulicz—have, as a rule, employed the other resource only when driven to it, and, therefore, in the more unpromising cases. If we exclude these

sixteen cases, there remain seventy-eight, with fifty-seven deaths, or 73.1 per cent. mortality. But even against this it may be urged that the advocates of the older plan, as Czerny, also have not operated indiscriminately, but have reserved the more favorable cases for resection of the bowel. Mikulicz puts the question thus: Which operators have, with both methods together, saved more patients—those who, in the majority of cases, have performed resection, or those who have followed the newer practice? In this light, also, the primary resection, with 57.7 per cent. mortality, shows better than the making of an artificial anus, with 70 per cent.

Mikulicz has performed primary resection 21 times, 14 times with a good result. Of the 7 deaths, 3 were from causes independent of the operation, 2 were due to faulty technique, and 2 must be charged to the method employed. The 7 cases in which he made an artificial anus all ended fatally; of these, only one was from causes outside of the operation.

In order to arrive at a just comparative estimate, Mikulicz puts the following queries: 1. What are the dangers of gangrenous herniæ, and by which method are these dangers better lessened or set aside? 2. What are the dangers of each method, independently of the existing disease?

The dangers from gangrene consist in changes in the bowel at the point of constriction, in the protruded loop of gut, and in the portion of bowel which runs *toward* the hernia; the last-named being by far the most serious. Either of the methods in question fulfills the main indication,—to set aside the obstruction of the bowel. Neither is absolutely safe or free from objection, and it is hard to judge between them. The preliminary steps of each—the division of the abdominal wall and of the stricture, the drawing down and freeing of the gut, and the removal of the gangrenous portion—are the same. For the process of suture, no anæsthesia, or, at most, a very superficial degree of it, is needful.

Besides the inconveniences of an artificial anus, there is the risk of the operation ultimately required for its relief, and the even greater danger of death from insufficient nutrition. This procedure sets aside some of the dangers of gangrene but imperfectly, if at all; while in primary resection these can be at least more clearly reviewed, and, for the most part, done away with.

Heydenreich, of Nancy, [3 Jan.13] takes much the same ground. He thinks it impossible to arrive at a definite conclusion as to the mortality attending the formation of artificial anus in gangrenous herniæ, but believes that the results of primary resection of the gut are about equally divided between success and failure. Should the two procedures be regarded as on a par in point of gravity, resection would certainly offer some great advantages. Certain conditions are, however, essential: the patient must be in a state to bear the shock of a prolonged operation; the surgeon must have confidence in himself; he must have adequate assistance and appliances; and the surroundings must be favorable to complete antisepsis. Otherwise, it is better to adopt, as a temporary measure, the simpler and less scientific expedient of fixing the opened gut in the wound.

Very similar views have been expressed by Gay and Burrell, of Boston, [99 Mar.3] and, from the report of the discussion upon their papers, met with the approval of Bradford, Cabot, Porter, and Richardson. It may not be inappropriate to mention that the last-named three surgeons expressed their preference for circular or end-to-end suture over lateral anastomosis.

Lockwood, of London, [96 Dec.,'90] analyzes 37 cases of gangrenous hernia treated by the formation of an artificial anus; 2 of these, both fatal, were his own, and 35 taken from the records of St. Bartholomew's Hospital. As 31 of the latter were also fatal, we have a mortality of 33 in 37, or 89.18 per cent. Lockwood is, therefore, led to pronounce in favor of primary resection and suture. Carl Beck, of New York, [150 July 15] takes the same view.

Povsing, of Copenhagen, [336 July 16] suggests that when there is any doubt as to the possibility of recovery of the gut it should be fastened in the wound by a suture through the serous coat, sterilized, and dressed antiseptically. He adduces a case in which he followed this course, and on the fourth day found the bowel in normal condition, and returned it.

The formation of an artificial anus, in cases of hernia where the gut is found to be gangrenous, is distinctly advocated, in preference to primary resection and suture, by Sonnenburg and Körte, [69 May 19] although the former admits that the procedure is neither free from danger nor always favorable in its results. Our corresponding editor, Holger Mygind, [673 Aug.] reports that Poulsen, of

Copenhagen, strongly recommends the abandonment of resection and suture for the making of an artificial anus, to be remedied by a later operation.

Ransohoff, of Cincinnati, $^{61}_{\text{Aug.13,20}}$ regards primary resection and suture as the ideal operation, but quotes with approval the original dictum of Czerny, "that there are cases in which enterostomy should be preferred; that the former procedure should not wholly supersede the latter."

Successful cases of resection and suture are reported by Burruano $^{589}_{\text{Mar.5}}$; Wanach, of St. Petersburg $^{21}_{\text{Aug.23}}$; Pinheiro, of Lisbon $^{549}_{\text{May 8}}$; Lukowicz, of Konitz $^{41}_{\text{Sept.1}}$; and Moreau, of Charleroi. $^{52}_{\text{Oct.31}}$

Shepherd, of Montreal, $^{282}_{\text{Apr.}}$ reports briefly for Boone, of Presque Isle, Me., a case in which nine inches of gangrenous gut were successfully excised in a man who had double inguinal hernia and extroversion of the bladder. One of the herniæ became strangulated and required operation.

G. A. Wright, of Manchester, $^{2}_{\text{Apr.30}}$ records the case of a laborer, aged 66, on whom an operation for strangulated inguinal hernia was performed, November 5, 1891; two inches of gangrenous small intestine were cut away and an artificial anus made. On the 21st of February, 1892, the parts were opened up and the gut resected, the two open ends closed, and then a lateral anastomosis effected with Senn's bone-plates. At each orifice in the skin (there were two) a portion of intestine about two inches long was left attached; the upper end of each of these was closed by Lembert sutures. The case did perfectly well up to the time of the report.

RADICAL CURE OF HERNIA.

W. H. Bennett, of London, $^{234}_{\text{Dec.,'91}}$ thinks it sound practice to attempt the radical cure of hernia, in persons otherwise healthy and below the age of 60, under the following conditions: (*a*) in cases of hernia in which trusses are useless, only partially effectual, or effectual only at the cost of great pain or discomfort; (*b*) irreducible herniæ; (*c*) where the patient's occupation is such as to involve the forcing down of the rupture; (*d*) cases in which the constant use of a truss is irksome or intolerably inconvenient; (*e*) in persons desirous of entering the public service; (*f*) in all cases of strangulated hernia, the bowel being healthy, free from adhesions, and the patient in a state to bear a prolonged operation.

Coley, of New York, [99 Mar.31] urges the submitting of all new methods of radical treatment of hernia to the test of time, the results attained being shown to be permanent before serious consideration is accorded them.

Richelot, of Paris, [17 May 31] reports the results obtained by him; of 138 persons operated upon, 2 died. He dwells particularly upon 82 cases treated between January 1, 1888, and June 1, 1891. Of these, 44 were followed up and 34 were to be regarded, he thought, as permanently cured; 8 had relapsed, but in a minor degree; in 2 there was failure, the herniæ being as bad as ever. His method was to isolate the sac, resect it, push up the pedicle, and then to insert the finger in the canal, which was sewed up with thick catgut.

Kocher, of Berne, [214 Sept.15] in a very interesting article, states that the results obtained by him from 1875 to 1886, in 42 cases, were permanent cures in 83.4 per cent., relapses in 16.6 per cent. From 1886 to the middle of 1891 he had 126 cases, of which 94 were followed up; in 20, or 26 per cent., relapses had taken place. This he ascribes to the fact that, in this latter period, he operated upon a larger proportion of the cases presenting themselves. He quotes with assent Mayor's dictum, "An operation for hernia in which the pillars of the ring are not sutured is not a radical one." One main reason assigned for some of the relapses is that the period of treatment was sometimes shortened, either because of the crowded state of the hospital or because the patients could not afford to be away from their work. Kocher thinks, with Macewen, that six weeks in bed and two weeks more of abstinence from physical exertion should be the minimum period allowed. When suppuration took place, the treatment was, of course, lengthened; as it was, also, when a drainage-tube was placed in the wound for four, six, or eight days, in order to prevent the formation of pus. Kocher admits also that, in some instances, the abandonment of the use of a truss, as advised by Socin, was an error. He enters at length upon the subject of the method to be employed.

For years he has recognized that one main point is the total removal of the sac and its neck, so that there shall be no pouching out of the peritoneum as an infundibulum into which a new hernia may take place. He was also satisfied that a reliable closure of the ring is a necessity; a proof of which is the frequency of relapse

of crural hernia where this cannot be effected, as compared with inguinal and umbilical where it can. At the end of his article Kocher proposes a new method: isolating the sac thoroughly, drawing it up through a small slit in the aponeurosis of the external oblique muscle, twisting it strongly, laying it down upon the surface of the aponeurosis and stitching it firmly there, the stitches including the underlying muscular fibres and passing through the twisted sac (see Figs. 1, 2, 3, and 4).

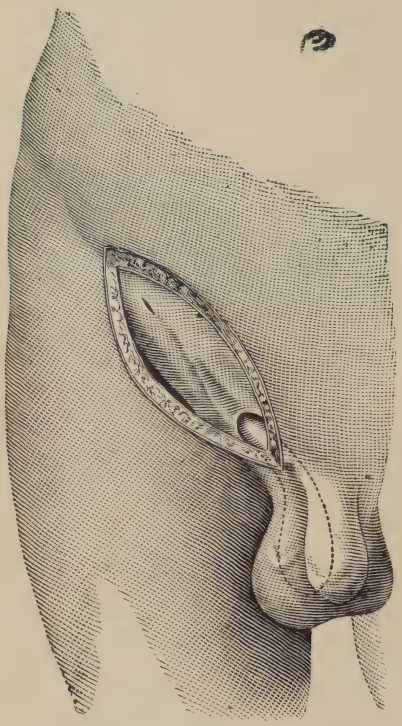


FIG. 1.

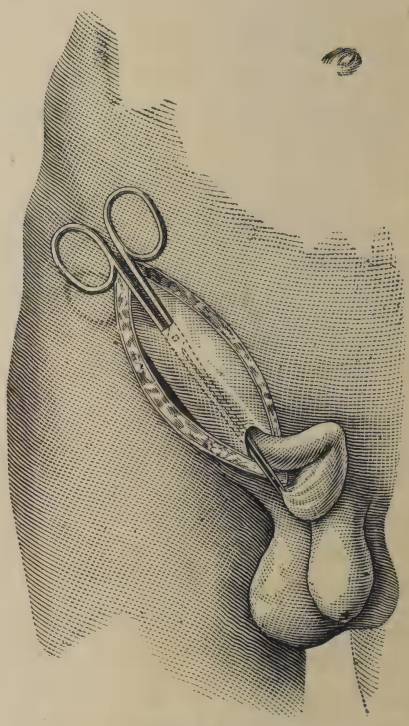


FIG. 2.

REDUCTION OF HERNIA.
(*Correspondenz-Blatt für Schweizer Aerzte.*)

Davy, of London, $^{6}_{\text{Nov.21,'91}}$ states that he has treated 20 cases by torsion of the sac, but has only obtained success in 5, or, at most, in seven of them; 13 were inguinal, 5 femoral, and 2 umbilical. He regards the use of suitable trusses as preferable to operation unless the latter course is adopted upon the occurrence of strangulation requiring a herniotomy. Mention is made of what are called "new" methods by Bottini $^{3}_{\text{Nov.11,'91}}$ and Parona. $^{17}_{\text{July 6}}$ The essential point claimed in each is the perfect closing of the

internal orifice. Neither seems to be more than a very trivial modification of well-known procedures. Under the name of "plastic herniotomy," Landerer [112 Mar.] describes a procedure which he has successfully employed in three cases of inguinal hernia, and which he thinks might be extended to other regions. As used by him, it consists in making an incision along the horizontal ramus of the pubic bone, and then detaching the outer pillar of the ring with a bit of the bone forming its insertion and shifting it over to the anterior surface of the symphysis, where the bit of bone is nailed fast. Thus pressure is made over the canal, and the external ring is narrowed to a mere slit.

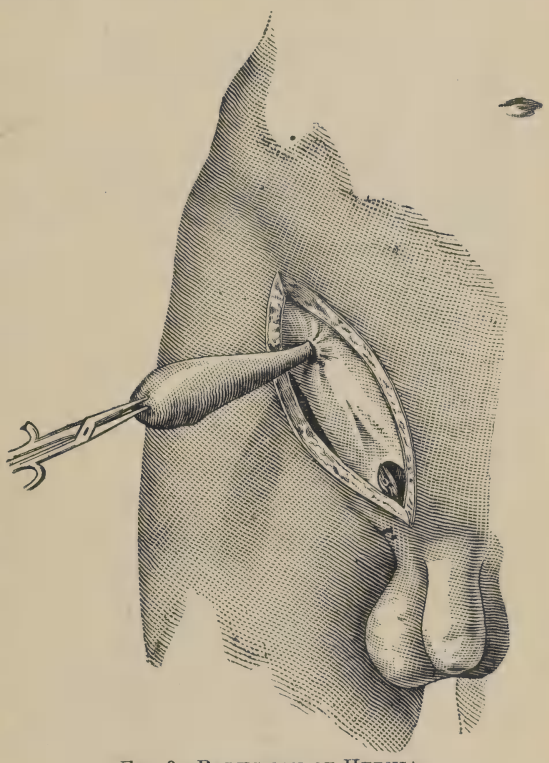


FIG. 3.—REDUCTION OF HERNIA.
(*Correspondenz-Blatt für Schweizer Aerzte.*)

Reports as to the radical treatment of hernia by the injection of alcohol, as recommended by Schwalbe, have been made by Steffen, of Zurich [214 Jan.15]; Hinke, of Vienna [2 Jan.2]; and Schmidt, of Hamburg. [112 Aug.] Steffen has substituted a longer and larger injecting tube for the ordinary Pravaz needle. After the reduction of the hernia he passes the needle in at the base of a fold of skin raised up over the external ring; if no blood flows in a minute or two, ½ gramme of alcohol (70 per cent.) is slowly injected, and this is repeated at other points until 3 or 4 grammes have been inserted. He prefers employing this procedure at intervals of several days, the patient meanwhile going about, and even following his occupation. The treatment may occupy a year and a half or two years, and is, therefore, very tedious, but is said to be

otherwise safe and not painful. In another place[6 Mar.19] Steffen is said to have employed this method in 326 cases of reducible herniæ. In 29 cases a cure was impossible, from circumstances such as obesity, or the great size of the rupture; in 13 the result was not known. In 257 inguinal herniæ, 216 were cured and 16 improved, with 23 relapses; of 13 femoral, 9 were cured and 2 improved, with 1 relapse; of 19 umbilical, 17 were cured; of 4 herniæ in the linea alba, 3 were cured, 1 improved. Hinke had treated 14 cases, with satisfactory results, so far as known, in 12. Schmidt keeps his patients in bed, and uses the injection daily for three or four weeks, or until an inflammatory infiltrate has formed, then at longer intervals. The statistics given are very meagre, and too few to be important.

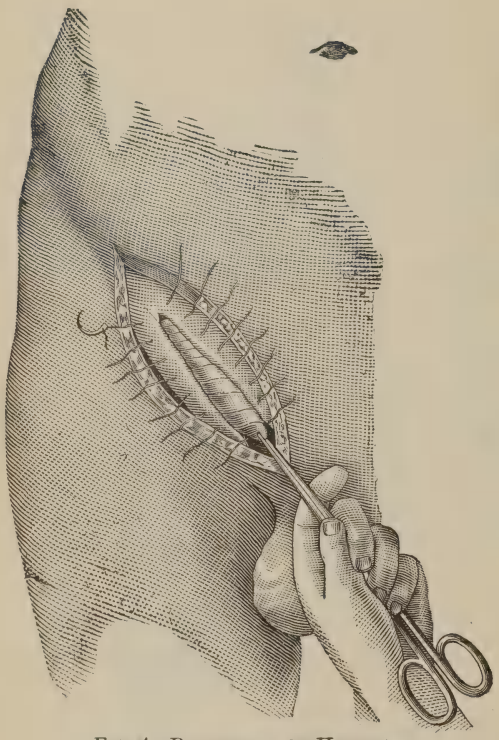


Fig. 4.—Reduction of Hernia.
(*Correspondenz-Blatt für Schweizer Aerzte.*)

Shimwell, of Philadelphia, Pa.,[19 Apr.9] takes the ground that an abnormally long mesentery is the main cause of the occurrence of hernia, and that all efforts at the closure of the canal or rings are misdirected; he advocates making an abdominal section, drawing out the intestine in successive portions, and folding the mesentery upon itself, retaining it by interrupted sutures.

Lucas-Championnière, in a communication made to the Congrès de l'Association pour l'Avancement des Sciences at Marseilles, in 1891, enters a strong plea for the radical cure of non-strangulated herniæ in women. Such operations, he says, are attended with very little risk, and the chances of success are greater than they are in the case of men. Out of 39 cases of this kind in females

(11 umbilical, 11 crural, and 17 inguinal), all treated by the open method, there was not one bad result. The most favorable conditions are found in young women, and in herniæ but moderately developed. Operation is always indicated except when other disease, or a state of cachexia, is present.

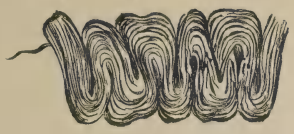


FIG. 1.

FIG. 2.

INGUINAL HERNIA.
(*Provincial Medical Journal.*)

Poore, of New York, $\frac{1}{\text{Aug. 6}}$ reports 25 operations on twenty-four children, in 19 of which a good result appeared to have been obtained: the other 6 had been lost sight of, and could not be traced. Two more are recorded by Piéchaud. $\frac{188}{\text{July 10}}$

Bishop, of Manchester, $\frac{26}{\text{Feb.}}$ discusses the radical treatment of *inguinal* hernia. He thinks the unfavorable attitude of the profession toward it is due to three causes: (1) a misconception as to the *rationale* of the disorder; (2) the repugnance of the public to any avoidable operation; (3) a distrust of the results. He points out that reducible hernia is generally brought about by a gradual, progressive yielding of tendinous and other structures, under such a strain as that of habitual cough, of hæmorrhoids, or of cystitis; and that it is not significant of weakly constitution or build. Taking the ground that an operation can only be recommended if it involve no additional risk, do away with the need of a truss, and effectively prevent the recurrence of the hernia, he describes

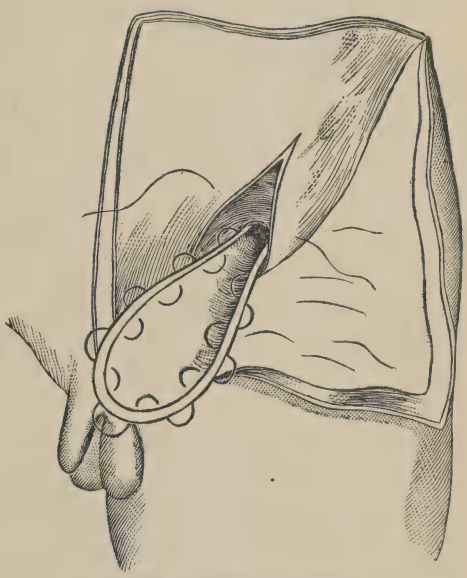


FIG. 3.—INGUINAL HERNIA.
(*Provincial Medical Journal.*)

the modification of existing methods by which he proposes to insure success. He adopts Macewen's view as to the conversion of the sac into a pad, and the formation of a natural truss by uniting the muscular wall over it, in the manner shown in the annexed figures (Figs. 1 and 2). Bishop suggests making the plug by carrying the thread in and out through the wall of the sac as shown in Fig. 3, when by tightening it up the wall will be puckered as in Fig. 4, and the suture being brought through the abdominal parietes as in Fig. 5 completes the "natural truss." He adopts also the idea of Greig Smith, of splitting the tendinous edges, so as to get a better and broader surface for union. This plan has been successfully carried out in thirteen cases.

FIG. 4.

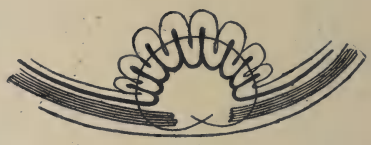


FIG. 5.

INGUINAL HERNIA.
(*Provincial Medical Journal.*)

Maglioni, of Buenos Ayres, $^{925}_{\text{June}}$ reports four cases in which the radical cure of inguinal herniæ was successfully accomplished by ligature and resection of the sac; in one instance the connection of the sac with the cord was so close that it was thought better to remove the testicle also, the patient being at least 50 years old, and insane.

Rose, of London, $^{22}_{\text{Dec.2,'91}}$ states that, of 53 cases of inguinal hernia treated by him within two years, in the first 24 the sac was removed and the pillars of the deep ring sewed together with stout catgut; recurrence took place in 3. In the remaining 29 silver wire was used, and a relapse occurred in only 1. Barrow $^{22}_{\text{Apr.20}}$ says that after some experience with silver wire he has gone back to silk for sutures in operations for the radical cure of hernia.

Testimony to the value of Bassini's method is borne by Habart, $^{623}_{\text{Jan.23,'91}}$ by Milliken, $^{59}_{\text{July 2}}$ and by Escher. $^{13}_{\text{May}}$ Escher reports having performed the operation 53 times in 45 patients; 9 cases were of strangulated herniæ, 9 of irreducible, while in 35 the con-

tents were free. Out of 30 herniæ in 24 patients, only 3 recurrences took place. Fatal results, from other causes, ensued in 2 instances. In 19 cases the separation of the sac from the spermatic cord was very difficult. Escher thinks the advice given by Bassini—to begin the isolation of the sac at its upper end—of great value. Milliken [101 July] reports also a case complicated with undescended testis, in which this method was successful; in another case reported by Hulke [6 July 16] there was a complete congenital entero-epiplocele with undescended testis, the tumor having made its way upward and outward. Hulke found Bassini's operation to answer well, but thinks it severer than others, and would reserve it for exceptional cases.

A modification of Bassini's method is proposed by Frank, of Vienna, [8 July 21] who records two cases in which he employed it with good result. He chisels out, on the upper edge of the horizontal ramus of the pubic bone, a somewhat deep canal, and lays the cord in this, covering it with the reflected and carefully preserved periosteum.

Page, of Newcastle-on-Tyne, [6 Sept.10] reports a case successfully operated upon by him after the method of Halsted, of Baltimore, which he thinks deserves more attention than it has had bestowed upon it, being, in his estimation, superior to Bassini's. Its peculiarity consists in the transplantation of the cord from the canal to a position within the parietal structures. This favorable opinion is contested by Burghard, [6 Sept.17] who thinks that the results obtained by Bassini, and following him by Berger, are such as to establish the greater advantages of the procedure known by the name of the former surgeon.

Karewski, of Berlin, [69 Feb.4] discusses the radical treatment of scrotal hernia in young children. He quotes the opinions of Anderegg, Wolter, Graser, and Haidenthaller, against it; those of Socin, Lucas-Championnière, Segond, and Trélat, in its favor; and the view held by Terrillon, Le Fort, and Richelot, that it should only be resorted to under urgent circumstances. From his own experience and from that recorded by others, he thinks the statement warranted that such operations should be performed in all cases in which the treatment by truss presents any considerable difficulty.

Broca [118 Apr.] quotes with approval the view of Berger, that during

the first year of life inguinal hernia, unless complicated with ectopia of the testis, should be treated by retentive apparatus only. In exceptional cases, when the protrusion steadily increases, or if it become irreducible, an operation for its radical cure may be justifiable. Strangulation very rarely occurs at this age, and many herniæ gradually cease to come down. After the first year, however, it is different. A truss is difficult to fit and often inefficient, and the cure, if accomplished at all, takes place only after a long time. Even then the hernia is apt to recur in later life. Broca makes the point that in the child it is not an acquired disorder, but a malformation that requires to be corrected.

At a meeting of the New York Surgical Society, Gerster $\frac{1}{\text{May 28}}$ presented a child upon whom he had operated successfully for a double inguinal hernia, first performing an external urethrotomy in order to obviate the risk of soiling the dressings by the urine.

Halsted, of Baltimore, $\frac{764}{\text{June}}$ has found advantage, when the bundle of spermatic veins is very large, in excising all but one or two of them, thus reducing the size of the cord and lessening the chances of return of the hernia.

Bennett $\frac{22}{\text{Aug.10}}$ is reported to have operated on one side, in a case of very large double inguinal hernia, in a middle-aged man, by invagination of the sac, using stout silk as the material for the sutures. Gelpke, of Liestal, $\frac{214}{\text{Aug.1}}$ reports the case of a man who was operated on in November, 1885, for an inguinal hernia of four years' standing; it was as large as a child's head, and the ring was wide enough to admit three fingers. Strangulation had never occurred, but trusses were useless to keep the bowel up. Castration was performed, and the ring was closed by Czerny's method. For six months afterward the man wore a truss, but since then, nearly seven years, he has had no occasion for it and no return of the trouble. A curious case is recorded by Shepherd $\frac{282}{\text{Aug.}}$ in which an intemperate man, aged 43, a month after an operation for the radical cure of a strangulated hernia, was attacked with mania, from no evident cause; the condition lasted four weeks, and then subsided, without interfering with his recovery. Other instances are reported by Allingham $\frac{22}{\text{Feb.17}}$; by Owen, $\frac{22}{\text{July 6}}$ the hernia being larger than a cocoa-nut, and containing the cæcum with the vermiform appendix, the ascending colon, a large coil of small intestine, and a mass of omentum, which was attached to the cæcum and

colon; by Hulke, [22 Mar.23] the patient being a woman, aged 37, who had previously had first the right ovary and then the uterus and left ovary removed, and who now had a large, partly-irreducible, labial hernia; by J. William White, [112 June] by Barker, [22 Feb.24] and by Villeneuve. [46 Aug.15]

Lucas-Championnière [212 Feb.25] publishes an account of four cases in which, after operations for the radical cure of herniæ, there ensued symptoms of internal strangulation, requiring laparotomy (in one instance three several times). All the patients ultimately did well. In a case reported by Kummer [197 Apr.20] a boy, 5 years old, had a right inguinal hernia which had been operated on once, but without permanent success; at the second attempt it was discovered that a portion of the bladder was prolapsed and adherent to the lower and inner border of the inguinal canal; the wound being enlarged, this herniated portion was replaced and the wound closed. Although the hernial trouble was relieved, symptoms of bladder irritability (incontinence of urine, etc.) continued as before the operation.

A case is recorded by Cochemé, [577 Apr.] in which, after an operation for the radical cure of a small inguinal hernia, in a man aged 32 years, a vesical fistula opening into the wound was developed on the second day, and continued to flow until the eighteenth; the retention of a catheter in the bladder, so as to prevent accumulation of urine, seemed to be the efficient cause of the cure, but gave rise to some local irritation.

The radical cure of *femoral* herniæ is discussed by Salzer, of Utrecht, [336 Aug.20] with special reference to those of large size. In the smaller, more ordinary cases operated on for strangulation, a permanent cure is apt to follow, as testified by Socin, Anderegg, and Haidenthaller; the narrowness of the canal favoring such a result. The latter surgeon states that, in cases where the protrusion is smaller than a hen's egg, there are three times as many permanent cures as recurrences, while in those in which it is larger there are nearly twice as many recurrences as cures. As to the suture of the crural ring, it is generally thought of small importance. Anderegg, Réverdin, and others regard it even as impeding the healing by the tension and consequent risk of sphacelus of the parts. On the other hand, Berger recommends operating in cases of young persons, and is convinced of the value of the suture. Wolf,

Wolter, and Schede hold the same opinion and adduce many cases in support of it. Different surgeons have aimed at accomplishing the object in different ways: Billroth sews the adductor fascia to the middle third of Poupart's ligament with silk; Czerny does the same with catgut; Schede with silver wire. Lauenstein has adapted Macewen's method to these cases and stitches together Gimbernat's ligament and the falciform process of fascia. P. Berger, after fixing the stump of the sac above Poupart's ligament, fastens the pectineal fascia to Poupart's ligament with three or four points of the quilt-suture; he insists that the thigh should be kept flexed on the abdomen during the entire time needed for the healing. Salzer himself looks upon a firm union of the fibrous tissues, in the case of a wide canal, as at least doubtful; the parts may be forced together, but the ligatures are apt to tear through, and then healing takes place by granulation, as if no suture had been applied. He advises using non-absorbable threads, so that they may remain as a sort of frame-work for the deposit of reparative material. Finally, he recommends a plan which he has himself used with advantage in one case: he raised up a flap of the thick fascia overlying the pectineus muscle and sutured it to Poupart's ligament.

In the account given by Berger himself $^{3}_{\text{May 11}}$ of his method, he lays stress upon carrying the sutures fixing the pedicle of the sac far up in the tendinous layer of the abdominal wall; in the male subject they must be carefully placed, well above the spermatic cord; and in every case the femoral vein must be avoided.

Some additional points are given by Marchand. $^{3}_{\text{May 18}}$ In six cases he found intestine alone in only one; twice the appendix was present and once it was ulcerated. Reduction was always more difficult than is usual in inguinal hernia. The sac was generally imbedded in fat, so as not to be easily isolated. His practice was to suture the cribriform and pectineal fasciæ together. Schwartz confirmed Marchand's statements, but recommends stitching the pillars of the ring and putting a catgut drain in the canal. Cases are reported by Tweedy, of Dublin, $^{22}_{\text{Feb.10}}$ and by Villeneuve, of Marseilles. $^{46}_{\text{Aug.15}}$

A few instances have been published of the radical cure of *ventral* or *umbilical* hernia. Pitschke $^{336}_{\text{June 18}}$ gives a notable one. A

woman aged 62 had a swelling reaching from the lower part of the right side of the abdomen nearly to her knees; it was an entero-epiplocele, the mouth of which was over two inches in diameter, and the skin over which was very thin; the contents were readily reducible. She had, also, double inguinal hernia. The large tumor had begun when she was 3 years old, and had grown very slowly until she had a fall, about four years ago, since which time it increased rapidly. No truss could be borne, and the skin on the posterior surface of the pouch was excoriated by the contact of urine and fæces. An operation was performed, the skin being incised from the upper part of the tumor down to the labium majus; the sac, which was quite thick-walled, was then isolated, constricted at its mouth with silver wire, and dissected away. Pitschke found, to his chagrin, that the lower end of the wound came just below the urethral orifice; but, by careful stitching and draining, great inconvenience from this was avoided. Some difficulty was experienced in bringing the edges of the gap in the abdominal wall firmly together, but this was finally accomplished. Another trouble arose from the small space in which the intestines were now confined; this was overcome by enemata administered with the patient in the knee-elbow posture. The woman was in good general health a year after the operation.

Rose is reported $\frac{22}{\text{July 13}}$ to have operated in the case of a woman aged 61, with an umbilical hernia of twenty years' standing, strangulated for several days. Another instance, in a man of the same age, is recorded by Shepherd, of Montreal $\frac{282}{\text{July}}$; the patient, who suffered also from double inguinal hernia, had delirium tremens, and, later, a troublesome cough, but did well.

Gilliam, of Columbus, Ohio, $\frac{9}{\text{Aug 13}}$ discusses the treatment of ventral hernia consequent upon abdominal section. He recommends, as preliminaries, the regulation of the bowels, massage, and the resort, once or twice daily for several weeks, to the Trendelenburg position, for the purpose of restoring the capacity of the upper abdomen. The operative procedure consists in depressing the pouch by means of a curved sound, bringing the sides together over it with tenacula, and marking out the elliptical line of contact with iodine or ink. Next, this track is followed with scissors and tenacula, so as to denude an elliptical strip, leaving an island of the same shape inclosed by it. If the space be

not large, it is altogether denuded. The parts are now again depressed, a rubber drainage-tube being slipped over the sound, and the outer margins, with the margin of the central island, if there be one, are brought into accurate apposition by means of three rows of continuous catgut sutures; the sound is now withdrawn, leaving the rubber drainage-tube in place. A gauze dressing is applied; strips of rubber adhesive plaster are placed at the sides of the abdomen, and tapes attached to them are tied over the dressing. The other details and the subsequent treatment are the same as in an ordinary case of abdominal section.

Benedict, of Athens, Ga., $\frac{59}{\text{Mar.5}}$ reports a case of very large congenital umbilical hernia, successfully operated upon when the child, a boy, was 53 hours old. The opening in the abdominal wall was circular, four inches in diameter; a thin, yellowish-white membrane was closely adherent to the peritoneal covering of the protrusion, and the separation of this was very difficult. The skin was dissected up for two or three inches on each side, and the subcutaneous surfaces brought into contact and secured with three silver pins and a number of silk sutures. Union took place well, and the cure seemed to be complete at the time of the report, three weeks after the operation.

DISEASES OF THE RECTUM AND ANUS.

By CHAS. B. KELSEY, M.D.,
NEW YORK.

EXCISION AND COLOTOMY.

McCosh [1 Sept. 3] reports five cases of excision of cancer of the rectum with good results, and argues in favor of the operation in certain cases. He is more conservative than many, and more radical than he will be when he has shortened a few lives in the hope of effecting a radical cure. He begins by calling attention to the radical difference in practice existing at present between English and German surgeons. The former hesitate to open the peritoneum and condemn doing so when it has become involved in the disease. They also, in a general way, consider cases which have involved neighboring organs (uterus, bladder, prostate) as unsuitable for operation. The Germans, on the other hand, care nothing for opening the peritoneum, and as long as the entire disease can be removed advocate operation, no matter what parts are involved. I use the present tense because McCosh does so, but within the past couple of years these different lines of practice have been steadily converging. The English have overcome their fear of the peritoneal cavity, and have abandoned the old arbitrary limit of four inches, or what the finger could reach above; but they still hold to the impropriety of operating on cancer of the rectum and adjoining structures, as distinguished from cancer of the rectum itself. The Germans, on their part, have become more conservative, as was inevitable, and are no longer as free with the knife. The mortality was out of proportion to the good accomplished.

In comparing excision with colotomy the author enunciates the following propositions: (*a*) excision is the more dangerous operation; (*b*) excision radically cures a certain number of cases; (*c*) excision affords a greater prolongation of life; (*d*) excision may be repeated a second or third time, and yet result in cure; (*e*) excision affords greater relief to the patient, even when relapse occurs.

He asks if these premises are correct, and proceeds to discuss them,—a discussion in which I am glad to join.

As to the mortality of excision, different operators report as follows:—

Reporter.	Operator.	Reference.	Number of Operations.	Deaths.	Mortality.	Excluding Complications.
Hildebrand	Göttingen clinic	301 B.27,p.329	57	20	35	24.5
Arnd	Kocher's clinic.	301 B.32,p.1	35	10	28.5	14.29
König	König.	336 B.24,'88	60	14	24	
Bardenheuer	Bardenheuer	336 B.24,'88	13	2	15.5	
Küster	Küster	4 p.193,'89	16	2	12.5	
Billroth	Billroth	8 No.34,'91	13	2	15.5	
Krönlein		214 Jan.14,'89	21	2	9.5	
Bloch		336 p.65	9	2	22.2	
Rehn	Rehn	226 p.317	7	3	42.8	
Arnd	Genzmer	301 B.32,p.1	17	4	23.3	11.6
Arnd	Kraske	301 B.32,p.1	10	4	40	
Arnd	V. Wahl	301 B.32,p.1	18	3	16.5	11.11
Arnd	Czerny	301 B.32,p.1	25	1	4	
Schwider	Bergmann		46	5	11 3	6.25
Hochenegg	Albert.	99 V.124,p.453	55	6	10.9	
Cripps	Cripps.	2 Oct.12,'89	30	2	7	
Kelsey	Kelsey	2047 p.47	7	2	28.5	
Total			439	84	19.1	

"The number of operations recorded above is 439, with 84 deaths, which gives a mortality of 19.1 per cent. No attempt has been made to collect all reported cases, but the results of several prominent operators, who have reported a series of cases, have been simply tabulated. Arnd collected 230 cases of operation, and estimated the mortality at 12.17 per cent. Welhaminow, from 335 cases, gives a mortality of 20.5 per cent.; Esmarch estimates it at 20 per cent.; König, at 16 per cent.; Bardenheuer, at 10 per cent. Thorndyke computes the mortality in 88 operations by the sacral method at 14.7 per cent.; Iversen, in 80 cases by the same method, at 25 per cent. The difference in these estimates is caused by the diversity of method of different reporters, some of whom

reckon only such deaths as are caused by shock, while others include all deaths which are due directly or indirectly to the operation. The death-rate of English operators is somewhat less than that of German surgeons; but this is due to the fact that the English are much more conservative in their selection of operative cases. Thus, Cripps states that only from 15 to 20 per cent. of cases are suitable for operation, while among German surgeons about 75 per cent. of all cases submit to radical operation."

The writer says: "It is difficult to compare this death-rate with that of colotomy, because the cases on which this latter operation is performed are, as a rule, in a much more desperate condition. The mortality, however, in cases of an equal gravity, cannot be more than half as great as that of the radical operation."

It is difficult to discuss the proposition that colotomy has not more than half the mortality of excision "in cases of equal gravity," but we think McCosh overestimates the mortality of colotomy. Nobody has ever done one hundred cases of excision consecutively without a death, and yet these figures will soon be reported in favor of colotomy. The gravity of colotomy depends on one thing, that of excision on another. A patient may die from an excision, when a colotomy would have been attended by scarcely an appreciable risk. I can imagine no case in which extirpation could be less dangerous than colotomy, no matter what its gravity. It is true that a patient may die from colotomy; but, were his case as grave as this, what chance would he have after excision? There are two classes of cases only in which colotomy is attended by any appreciable risk,—extreme exhaustion and severe intestinal obstruction; in all others the mortality can easily be put at not more than 1 per cent. There is no class of cases of excision in which the mortality can be brought as low as this. I do not think it can be justly stated, therefore, that, in cases of equal gravity, the mortality is anything like one-half that of excision. When a colotomy is done on a patient in any sort of condition to bear even a slight surgical operation, the most encouraging prognosis as to recovery can be safely given. No such prognosis can be given, even in the most favorable cases, for extirpation of the rectum. Colotomy is attended by few accidents, and when it is recommended the chances of recovery can be closely estimated from the patient's condition. This cannot be done in excision, with its attendant shock and

danger of subsequent periproctitis or peritonitis. Every man who has done many colotomies knows that, in ninety-nine cases in a hundred, when he advises colotomy he apprehends very little danger, while when he advises extirpation he counts on a mortality of at least 20 per cent. This applies, however, more particularly to cases in private practice, seen before the last stages of the disease. In hospitals, where cases of cancer of the rectum present themselves not infrequently in the last stages of obstruction, the mortality of colotomy will be much higher, but that of excision, under the same circumstances, would be enormous. I take this opportunity of calling attention to the utter worthlessness of statistics of this sort. Of what use is it to say that the mortality of extirpation is 20 per cent. and that of colotomy 1 per cent., for example? The mortality of either can be made to vary from 1 to 90 per cent. by selection of cases. McCosh can do twenty excisions without a death, and twenty colotomies and lose half of them; and, what is more, he can tell pretty accurately beforehand what the result is to be by looking at the case. Such figures are of little use in regulating practice. Given a particular case of cancer of the rectum, and the experienced practitioner will easily say to himself that the danger of excision will be 1 per cent. or 90 per cent. in this case, and the same in colotomy. Nevertheless, take any hundred cases as they present themselves, and I am convinced that the mortality of excision would be much more than double that of colotomy.

The ratio of radical cures (cases in which there had been no recurrence for four years) to the number of operations has been collected in the following table, and is between 10 and 11 per cent.:—

Kocher	reports	9	cases	out of	35	operations.
Bardenheuer	"	3	"	"	45	"
Hildebrand	"	3	"	"	57	"
Czerny	"	3	"	"	45	"
König	"	3	"	"	60	"
Krönlein	"	3	"	"	22	"
V. Wahl	"	2	"	"	18	"
Von Bergmann	"	3	"	"	46	"
Genzmer	"	1	"	"	17	"
Cripps	"	2	"	"	30	"
Total,		32	cases	out of	375	operations.

These figures are also of very little value because they tell us

nothing of the extent and site of the disease removed with this result. We all know that epithelioma, low down in the rectum and comparatively circumscribed, should be removed, and that, as in epithelioma of the lip and mouth, the result is comparatively favorable. Were any of these cases of that sort, and, if so, how many? because as to them there has never been any discussion. Or were they cases of annular disease within the rectal pouch? The distinction is important, and the cases are not to be grouped together, either as to mortality of operation or liability to recurrence.

But still another point arises, even accepting the figures as they stand. Ten per cent. of cases are cured, and 20 per cent. die from the operation. In other words, the operation kills two patients for every one cured. It may be said that they were doomed to death by the disease, and that is true; but, for the ten lives prolonged four years and more, twenty have been shortened, it is impossible to tell how much, for cancer of the rectum sometimes kills very slowly. In considering the aggregate amount of good done by excision as compared with colotomy, this death-rate is of the greatest importance. By the former, taking one hundred cases as they present themselves, we shall kill twenty by our surgery and cure ten. With colotomy we shall not kill more than one or two (and those only in the very last stage of the disease) and we shall cure none. But no man will always do colotomy in preference to excision; for in every hundred cases there will be a few strongly inviting extirpations, and these will do well, and among these will be found the cases of cure. Neither, on the other hand, will any man always attempt excision. In other words, these cases cannot be grouped and summarized. Each must be treated by itself.

McCosh's third proposition, that excision affords greater prolongation of life than does colotomy in cases where relapse occurs, is answered in two ways. Where the disease recurs in the wound before complete cicatrization, I think its progress is apt to be much more rapid than it would have been if uninterfered with. But whatever length of life is gained before relapse in other cases is more than counter-balanced by the 20 per cent. mortality.

The other propositions do not admit of any argument. It is true that a cure may result after a second or third recurrence, and

that excision affords greater relief to pain than does colotomy. In fact, none of the author's statements are in any way exaggerated, and he writes very conservatively; nor are any of his conclusions in any way erroneous.

I have no bias in favor of either operation, but the occasion has seemed favorable for drawing attention to the two methods of treatment. My own views on the choice between extirpation and colotomy in the treatment of strictures have been concisely stated, [1] and are as follow:—

In selecting the proper treatment in any case of stricture of the rectum, the diagnosis between malignant and benign disease is of the first importance. Much temporizing may be resorted to in non-malignant stricture, but in cancer the surgeon is brought at once to the choice between extirpation and colotomy. One of these must be decided upon, and it is not necessary here to argue the point that as soon as the decision is reached it should be carried into effect. Nothing is ever gained, and many years of useful life may be lost, by postponing till a more convenient season an operation for cancer of the rectum, whether it be extirpation or colotomy. If colotomy is indicated at all, the time to perform it is immediately after it has been decided not to do excision, not after acute intestinal obstruction (a rare thing in cancer) has set in, or after the sufferer has reached the closing days of lingering disease.

The choice between extirpation and colotomy in any case of cancer may be easy or may be very difficult. In some cases extirpation is manifestly not to be thought of and immediate colotomy may be done. In others extirpation holds out so good a chance of prolonging life, and possibly even of effecting a radical cure, that it is plainly indicated. Between these two classes there is a large group of cases where the indications for treatment are not as plain as they should be.

The operation of extirpation of the rectum dates back to 1830, when it was advocated and practiced by Lisfranc. After a short period of popularity it was almost abandoned on account of its bad results. Within the last twenty years it has again become popular. Is history to repeat itself? Perhaps so, in a measure; but, if so, we shall not have traveled in a circle. Sixty years ago it was extirpation or nothing. Now, it is extirpation or colotomy.

The late Dr. Van Buren, about ten years ago, tried to lay down the rules which should guide us in selecting cases for excision. They were very simple. The growth must be distinctly circumscribed, movable on subjacent tissues, and within easy reach by an incision through the perineum. Since his time Kraske has given us an entirely new operation. By an incision over the sacrum, he proved the possibility of resecting portions of the rectum too high to be reached by an incision from the perineum and too low to be reached by laparotomy. By a combination of Kraske's operation and the old one by perineal incision, it has, therefore, become possible to either resect long pieces of the rectum or to amputate long portions which would have been inoperable, according to Van Buren's rules, on account of their distance from the perineum. The advance must not be overestimated. We can now amputate six inches of rectum, instead of three, or we can resect a circular carcinoma at a point six inches from the anus, but to do any good we must still confine our operations, as Van Buren insisted, to cancer of the gut and not of the gut and surrounding tissues, and to a very early stage of cancer at that.

Now, even in these cases the question is: How much good do we do? Given an annular carcinoma of the rectal pouch suitable for operation according to the rule just enunciated. It is a brilliant piece of surgery to dissect it out, unite the divided ends of the gut above and below with sutures, and secure healing without even the complication of a fæcal fistula; but, by adopting this as a routine practice, does the surgeon, in any considerable number of cases taken together, lengthen or shorten life over and above what would result from colotomy in the same cases?

The surgeon at first attacks these cases hopefully. It seems as though so brilliant an operation as excision, when successfully performed, must be of some benefit. But very soon it begins to be apparent that the results are very unsatisfactory. A certain proportion of the cases die from the operation, and such a result is the more disheartening when he considers that if he had been content with colotomy the patient might have lived in comparative comfort for two, three, or even four years. But even in the patients who recover from the operation, when the operator finds a recurrent nodule in the cicatrix at the end of three or four months, he is apt to ask himself if the operation has paid.

There is no escaping the conclusion which a study of these cases makes evident, that cancer anywhere in the length of the alimentary tube is an exceedingly hopeless and intractable disease, tending almost inevitably to rapid recurrence, no matter how completely it may be removed.

At a meeting of the Royal Medical and Chirurgical Society, about three years ago, Kendal Franks reported the results of fifty-one collected cases of removal of cancer of the colon. One patient only in fifty-one was cured for four years, and the direct mortality was 40 per cent. In cancer of the rectum, if the cases are selected with care, the mortality will not be more than about 20 per cent.; but the cures for four years will be very, very few, and recurrence within a year will be the rule.

In trying to reach safe conclusions on this subject it is necessary to be very accurate. There are many cases in which extirpation should certainly not be performed, and there are some which just as certainly should not be subjected to colotomy; at least, until after excision has been tried. The former are those of extensive disease involving not only the rectum but the adjacent tissues, and in this class I personally include many upon which others would operate. For my own part, I have about finished trying to dissect a cancerous rectum away from the base of the bladder when it would almost require a microscope to decide whether all of the disease had been removed or not, for in such cases I expect an immediate recurrence, and often before the incision has healed. I have also about finished removing the deep urethra, prostate, and seminal vesicles to make sure without a microscope that all of the cancer is removed, for in those cases I expect either death from the operation or immediate recurrence. The cases in which extirpation should be done are those of epithelioma low down in the rectum, and more especially those which begin at the anus and secondarily involve the rectum. These are the ones which are curable by excision; or, if not curable, those in which recurrence is longest delayed.

But between these there is a class of cases in which the rule for treatment is still, as I have said, to be determined. These are the cases of annular scirrhus of the rectal pouch, or even of the upper rectum, which are manifestly removable without more than the average risk. Given, say, twenty of these cases, which opera-

tion will give the greater length of life for the group, extirpation or colotomy? Unquestionably, I believe, colotomy.

In extirpation we do a capital surgical operation having a very high death-rate, and for what? For the hope of cure it is true, but we do not cure. In the cases which we lose we shorten life sometimes by years. In those which recur before cicatrization even is complete we often do the same. In those which recur after a few months, the operation may be said to have prolonged life by just so long as elapses between the extirpation and the recurrence. In colotomy we do an operation with scarcely any risk and with no hope of cure; but we invariably prolong life, and sometimes for several years; we relieve pain, we secure the greatest possible length of days next to a cure, and we lead the sufferer gently down to the grave. In the one case we aim high and fail; in the other we are satisfied with less and accomplish much more.

In arguing thus for colotomy in preference to excision in many, though not in all, cases, I am addressing myself to those who know what colotomy is, what it will do, and what are its results. To those not familiar with the results of the operation the argument may have some weight; but to those who say they believe that it inflicts a disgusting deformity worse than death itself it can have no force at all. Fortunately for the sufferers from cancer of the rectum, the latter class are rapidly becoming converted to a more intelligent view, and but few of them remain. Colotomy, especially inguinal colotomy, relieves pain, does away with the constant tenesmus and discharge from the rectum, which, by their exhausting effects, are the immediate cause of death, delays the development of the disease by preventing the straining and congestion of defecation, prevents absolutely the complication of intestinal obstruction, which is another cause of death, enables the patient to sleep, eat, and gain flesh, and often makes him think himself cured in spite of the plainest prognosis to the contrary. Instead of passing his days and nights upon the commode, wearing out his life in the effort to free the bowel from its irritation, he has one or perhaps two solid fæcal evacuations from the groin in twenty-four hours. Is it pleasant to have the gut end in the left groin? No. But after a very few days the patient with cancer of the rectum, whose anus has been placed in the groin by

the surgeon, will tell you that life, from having been a constant torment, has again become worth living.

I often wonder what these men, who talk about colotomy as something inexpressibly disgusting, imagine Bryant, Allingham, Cripps, myself, and others who practice the operation are doing with our patients. We might naturally be supposed to be anxious to relieve suffering and earn their gratitude, and, after a few years of experience and a few hundred trials, we might be supposed to know whether our patients were grateful, or whether they were poor, loathsome sufferers from a surgical operation for which they daily cursed us. And yet only a year ago no less an authority than Senn wrote that he did not believe that any patient lived who had ever submitted to a colotomy who had not rather be dead. Is it possible that he has had little or no experience with colotomy, or that, because his mind runs so strongly to anastomosis and excision, he is not perhaps as good a judge of what the operation will accomplish as those who do it every week of their lives?

In substituting an artificial anus in the groin for the natural one, it must be remembered that patients with cancer of the rectum, as a rule, have very little sphincteric power or ability to retain fæcal matter. Either there is a constant discharge, which necessitates the wearing of a napkin at all times, or there is a constant uneasiness and fear of accident which keeps them in close proximity to the commode day and night. To them one daily solid evacuation, even if it does escape from the groin, is a great advantage, and the choice is not between fæcal control by the anus and incontinence in the groin, but between one or two daily solid evacuations from the groin and a constant leakage of bloody mucus and fæces from the natural anus.

In choosing between extirpation and colotomy, in non-malignant stricture and ulceration, it is necessary to consider the amount of the disease; hence the extent of operation and the patient's ability safely to go through with it. Neither will be undertaken, of course, until it is evident that all other methods of treatment are useless. When this conclusion is reached, it remains simply to choose between an operation in the groin of very slight risk and one upon the stricture having all the risks of extirpation for cancer. Where the stenosis and ulceration are of limited extent and easily approachable by the dorsal incision, and the patient is in fair gen-

eral condition, extirpation is to be preferred; in other cases, colotomy. Here, also, it is to be remembered that a rectum, after the operation of extirpation, is seldom a perfect one in function, and that we often pay a large price in the way of risk for the choice between incontinence in the perineum and incontinence in the groin.

In a clinical lecture at the New York Post-Graduate Hospital, the various indications for the performance of colotomy have been dwelt upon at some length by Kelsey. [80 Jan. 15] The two cases operated upon before the class were of entirely different nature, and yet each was treated in the same way. The first was a young man of 32 years, in fair general condition. His history in brief was, that he had had disease of the rectum for a couple of years, with constantly-increasing difficulty in having a passage, and that for the last week he had been unable to have any passage at all. The finger in the rectum showed the bowel to be filled up by a cancerous mass just within the sphincters. This mass was as large as the fist and immovable. There was no glandular involvement discoverable and the abdomen was not distended, though the descending colon and flexure were full of scybala.

It was pointed out that the case was not one for extirpation, because the growth was not confined to the rectum, but involved all the adjacent tissues; could not be completely removed without fearful risk to life and the certainty of return within a few weeks, probably before cicatrization was complete. It was also pointed out that, although the lumen of the gut could be re-established by cutting, burning, or divulsing, it would be very primitive and dangerous surgery, and that there were but two things to be done in any case of cancer of the rectum,—either to remove it completely or let it entirely alone.

The second case was also that of a young man, of about the same age and apparent general condition, but suffering from an entirely different trouble, and yet one calling for colotomy as plainly as the first, but for very different reasons. The patient had had trouble with his rectum ever since an attack of dysentery five years before. All this time he had been under medical treatment, some of it by good and competent men. When the disease began he was a strong, healthy young mechanic. When shown to the class he was prematurely old, unable to earn his living, had spent all

his own and his father's money in the search for health, and was steadily growing worse. From 160 pounds he had come down to about 100. He complained little of pain, but spent many hours of the day and night at stool. Sometimes he passed only a little blood or half a cupful of slime, but when any solid fæces were passed it was only after prolonged effort. He was worn out and discouraged, and had come half across the continent to have a colotomy performed, which had been fully explained to him by his physician at home.

On examination, a dysenteric stricture was found at three and a half inches, and below this a complete destruction of the rectal wall by deep ulceration, covering many square inches. There was no obstruction, and little danger of any, to a serious extent, in the future. If there had been, the stricture could at any time be easily divided with the knife and kept open with the finger or bougie. Colotomy was not, therefore, done because of any fear of fatal obstruction, nor to relieve pain, nor, indeed, on account of the stricture, but because of dysenteric ulceration of the rectum. The stricture alone, or joined with a moderate amount of ulceration, could be handled by simpler means; but that amount of ulceration was pointed out to be curable in only one way,—colotomy. The impossibility of determining the exact amount of disease contra-indicated extirpation, as dysenteric ulceration was apt to be extensive and not confined to one spot; and the removal of one ulcer and leaving another a few inches higher in the rectum would be unfortunate.

The general indications for the performance of colotomy were stated as follows: 1. In all cases of cancer which cannot be completely extirpated, where the disease is liable to produce any degree of obstruction or is broken down and discharging into the rectum. It is possible to have cancer in or near the rectum which shall cause no symptoms referable to the rectum, and, therefore, furnish no indications for operation. 2. In all cases of incurable non-malignant ulceration where the disease is too extensive to admit of complete resection of the ulcer. 3. In all cases of threatened obstruction where the obstruction cannot be permanently overcome by attacking it directly; for example, the obstruction due to old pelvic cellulitis in women. 4. In all cases of recto-vesical fistula. 5. In all cases of congenital malformations, where the

rectal *cul-de-sac* cannot be dissected out and brought down to the surface.

Noticing these indications carefully, it will be seen that colotomy is always advised with the one condition, where nothing else can be done,—cancers that cannot be removed, extensive ulceration that can be cured in no other way, threatened obstruction from any cause which cannot be relieved by attacking it directly, congenital malformations where a useful anus cannot be made in the perineum. In only one class of cases is there no proviso,—the recto-vesical fistulæ. In other words, we do not rashly recommend this procedure to the exclusion of other things; and if we do it more frequently than the general surgeon, it is because we know how much relief it will give, and are anxious to afford that relief at the earliest possible moment. If colotomy will put thirty pounds of flesh on a cancerous patient and cause such an amount of relief to his local symptoms as to make him believe himself entirely cured; if, by removing the chief cause of local irritation, it will tend to retard the inevitable increase in growth; and if the artificial anus is not a cause of mental or physical annoyance, why delay giving the patient the advantage of it at once? and why put off an operation with less than 1 per cent. mortality until, in the midst of intestinal obstruction, the mortality becomes 33 or 50 per cent.?

One of the greatest advances in the surgery of the rectum, of late years, is the doing away with the idea that intestinal obstruction is the only indication for colotomy. It is, in fact, only one of many of the indications for this operation.

There have been several articles in the current literature of the past year, notably those by Kappeler, $^{214}_{\text{Jan.}}$ by Ewald, $^{8}_{\text{Jan., Feb., Mar.}}$ and by Allingham, Jr., $^{2}_{\text{May 14}}$ on colotomy, and all pointing the same way. It has, indeed, taken the Germans a good while to see the advantages of this method of treatment in cancerous and also in non-malignant disease; and, as they have led us in extirpation, we have led them in colotomy; but we find the proper limits of extirpation gradually becoming more and more strictly defined in German practice, and colotomy, as a natural consequence, coming into greater popularity. In the end we shall reach the true solution by the honest comparison of results in a spirit of purely scientific inquiry. Neither method of treatment is to be abandoned. It

only remains to determine, to the satisfaction of all, which gives the better prospect of relief in any particular case. In some it will be extirpation, in others colotomy; and, before another year has passed, I venture to predict that the general rules guiding the choice of treatment will be almost universally agreed upon the world over.

A word may be said concerning the tendency at present manifest, particularly in England and Germany, to allow the colotomy wound to take care of itself, and to dispense with any suturing. In England a glass rod is passed under the mesentery, and in Germany the incision is plugged with a little gauze and no sutures are deemed necessary. An incision into the abdomen left in this way carries great risk of evisceration by the side of the loop of sigmoid flexure fastened into the wound, and must be constantly watched for the occurrence of this accident. The editor has seen two such cases, one terminating fatally from the carelessness of the attendant, who neglected to examine the patient until many coils of small gut had escaped and become matted to the dressings. In both cases some sutures were used, but not enough.

ULCERATION.

Gibbs $_{\text{July }23}^{1}$ lays special stress upon the influence of varicose veins in the rectum in causing simple ulceration. He refers to ulcerations of the rectum not dependent upon syphilis, cancer, tuberculosis, or any known form of constitutional taint,—lesions generally due to mechanical or other local injury, and which, at first, are generally slight in extent, but which not only do not tend to spontaneous cure, but even at times eventuate in great destruction of tissue and incurable stricture. He says: "The opinion prevails in the profession, derived from the somewhat loose statements in surgical literature, that any marked destruction of the lower gut is presumptive evidence of syphilis, unless positive proof is adduced to the contrary. In other words, the illogical position is assumed that, because some patients have, or are supposed to have, some form of syphilis in the rectum, all cases of doubtful etiology should be forced into the same category. It is to methods of this kind that exception should be taken.

"Being connected with the clinic for diseases of the rectum in the New York Post-Graduate Hospital, and having had, in

addition, opportunity to observe Kelsey's cases in private practice, and to use the same for the purposes of this analysis, I have tried especially to answer the following question: 'Does syphilis in any form play an important rôle as a causative factor, from the standpoint of frequency, in ulceration and stricture of the lower gut?'

"Were it not for the certainty of antagonizing an accepted article in the pathological catechism, I should say that syphilis tries hard to avoid the rectum; and, when hard pressed, invades it no more frequently than the stomach, small or large intestine, or any other part of the alimentary canal. The following statement stands unassailable:—

"In diagnosticating any real or supposed syphilitic lesion of the rectum, the same evidence should be produced and required as in determining the same disease in any other organ; neither more nor less. In other words, diagnosis by exclusion is not scientific, and does not warrant positive conclusions on unsettled questions of pathology."

Gibbs holds that where cancer, tubercle, and dysentery can be excluded from the etiology, ulceration, no matter how extensive, is more likely to be due to some simple cause, as constipation, straining, or surgical traumatism, than to syphilis; and that, at all events, the latter should never be considered the cause without proof. [Ulceration of the rectum is undoubtedly due to syphilis in some cases, but to jump to the conclusion that a stricture which is not malignant is syphilitic is as logical as to say that a pharyngitis which is not diphtheritic must be syphilitic. And yet this is constantly done in practice, and done with an ignorance and persistence, with a supercilious air of wisdom against which all denials will be in vain, which to the innocent wife or maiden must be simply maddening. How the idea ever originated, or how it has become so deeply fixed in the minds of the profession, I do not know; but the fact remains that any lady, no matter how virtuous or refined, whether she be single or the mother of children, whether she be old or young, the wives and daughters of numbers of our own profession, perhaps, must, when they have ulceration of the lower bowel, be made to understand that in some way they have become infected with venereal disease.—Ed.]

Gibbs states that "the most perplexing feature of the disease is its chronicity, or, worse still, its tendency to spread from small

fissures to decided ulcers in patients not decrepit by age, or broken in constitution by vicious excesses or constitutional dyscrasia; but, on the contrary, in the prime of life and vigorous health. The question arises, Why do not these ulcers heal in about the same time and under the same treatment required in the cicatrization of similar sores in other parts of the body?

"Why is it that a burn in the mouth, for instance, causing destruction of the mucous membrane, heals rapidly, even in debilitated subjects, while a like injury to the rectum means weeks or months in bed? The grinding of the sphincters, by keeping up irritation, may have something to do with it, or a generul debility from independent organic disease may play a small part; but in many cases the sphincters do not grind, and the general nutrition is excellent. The one answer that seems reasonable to me has been forced upon me by the one practical necessity of the treatment.

"In spite of all that can be done, these cases remain stationary unless indefinite rest in bed be insisted on and carried out. Feed your patient till he is robust to obesity; stretch his sphincters to your heart's content, if he will let you; curette his ulcer or cauterize through a speculum; but unless the recumbent position is maintained for weeks or months, failure is the only reasonable anticipation. This position involves a change in the venous circulation of the gut, and a change of very decided character.

"In the erect position gravity determines sufficient blood to engorge the veins of the whole lower extremities, which, when not properly supported, become tortuous and dilated, leaving the condition known as varicose. There are, then, localities where chronic dilatation of veins is common, all three often seen in the same individual. They are the legs, the rectum, and the spermatic cord. In this last the symptoms of varicocele are pain and œdema, but in the first two is added the well-known chronic varicose ulceration.

"The history of these cases varies but little. They usually come from some traumatism sufficient to cause a break in the skin or mucous membrane; then septic infection is introduced, and the impaired circulation does the rest. The little sore, when neglected, gradually extends to almost any size. In the lower leg this form of ulceration is common enough to be a public nuisance in our surgical dispensaries. The same thing in the rectum has not been emphasized, although the analogy is complete.

"The so-called hæmorrhoidal area extends from the anus about three inches up the gut, and consists of a venous plexus encircling the intestine for that distance and lying in the submucous connective tissue. At the upper margin of this zone many of these veins perforate the muscular coat and pass upward, communicating with the prostatics and other plexuses in the vicinity. The middle part of the rectum is largely supplied with veins, which are supported only by the extremely lax mucous membrane of the organ.

"In children and young adults the varicose condition is rarely developed, but most people above the age of thirty are more or less subject to this apparent inability on the part of nature to take care of itself.

"No one will deny the prevalence of hæmorrhoids, yet even this condition is not necessarily even suspected till it has reached an aggravated form or causes acute symptoms. In one set of cases the first indication will be hæmorrhage from intense venous engorgement after years of uncomplaining existence. Again, it may be pain due to inflammation or extravasation. The most pronounced cases are those in which the tumors are large enough to prolapse during the act of defecation; yet many remain for years without serious annoyance.

"If the well-marked cases of varicose development are of such frequency, it is hardly a presumption to state that milder forms are equally common. Here are all the conditions necessary to produce simple varicose ulceration, merely waiting for the initial injury to start the process. It is true that we cannot here examine the condition of the two venous systems of the lower gut as in the leg, on account of the anatomical inaccessibility of all but the lower submucous veins. Those high up, or on the outside of the rectal wall, are beyond the reach of investigation. Consider the matter in this wise: We have a hollow tube, normally collapsed, unsupported by strong muscles, largely composed of two complex venous plexuses in a dependent part of the body, at the lowest point of the portal system, and subject to many mechanical influences to produce engorgement of blood in veins not even properly supported by valves. Constipation means pressure and congestion. Pressure of a displaced or gravid uterus acts in the same way. Coughing or crying produces temporarily the same results, as can easily be seen in the noisy stage of ether narcosis.

"The analogy between the consequences of varicose disease in the rectum, on the one hand, and the lower extremity, on the other, is carried along a step when we come to the all-important question of treatment. The cardinal principle of success involves the restoration of the impaired local circulation during the period of repair.

"In the leg, the simple cases can be handled by pressure and support by means of strapping with adhesive plaster and well-applied bandages. After complete cicatrization, recurrence is prevented by the use of elastic stockings. In large ulcers of long standing, when both deep and superficial veins are diseased, and the limb is in a state of chronic œdema, severer measures are indicated; excision of the unsound granulations, or, much better still, destruction of the diseased veins by careful dissection or multiple ligation.

"A small ulcer of the rectum, perhaps the size of a postage stamp, of course, cannot be treated by strapping or bandaging; so we must accomplish the same thing by the next best means in our power,—that is, prolonged rest in bed, in the recumbent posture. Nine out of ten cases involve but a small area, from that of a thumb-nail to that of a silver quarter, most frequently situated posteriorly and from one to two inches from the anal verge. The muscular coat is seldom penetrated. In fact, the affair seems almost insignificant, until experience proves unmistakably the error of such on opinion.

"Leaving out of the question the pain and disability consequent to any chronic affection, the possibility of being aggravated beyond the reach of simple surgery has to be grappled with. Small ulcerations are tedious and difficult to handle. Large ones may, and do, assume proportions in incurability, or even positively threaten life. As time is an important consideration, the question of operation generally presents itself. The propriety of removing such hæmorrhoids as may exist is apparent, if operation of any sort is decided upon. Failure to detect and incise existent submucous tracts is fatal to success, alike mortifying to the surgeon and disheartening to the patient. When an ulcer has closed down to a small spot which persistently remains open, the existence of these sinuses should be suspected. These complications eliminated, curetting of the ulcer through a large speculum is probably

the most efficient method of stimulating sluggish granulations. Stretching of the sphincters is futile, for the reason that the paralysis aimed at wears off in a few hours. The only effective means of putting the parts at rest long enough to do any good is the careful use of the knife. The proper method, and one that is applicable to nearly all cases, is to make an incision longitudinally through the base of the ulcer, deep enough to sever the circular muscular layers underlying. This cut, unless very superficial, should be continued through to the anus, for the additional purpose of securing drainage, thereby avoiding the unquestioned danger of periproctal cellulitis. Whether the necessity exists for the performance of a complete proctotomy, which this incision involves, must be decided by the merits of the case. Although curetting and incision save weeks of time, after-treatment is of equal importance. Rest has been sufficiently dwelt upon, and as cicatrization gradually takes place applications of weak solutions of nitrate of silver (gr. x–lx to ʒj—0.60–2.50 to 30 grammes), once or twice weekly, rarely fail. Persistence on the part of the attendant, and docility on that of the patient, almost guarantee a result, provided time is allowed. Prognosis as to duration of treatment is out of the question. Two or three months for a moderately large ulcer is satisfactory work."

Gibbs says that the last-mentioned group may be put down as the worst that ever falls to the lot of the general practitioner. Many of them are beyond the stage when such local treatment as has been described can do any good, and are to be relieved only by complete excision of the diseased area or by colotomy

As to this question of syphilis as the cause of ulceration of the rectum, we are glad to notice, amongst the literature of the year, ten reports of careful work which indicate a tendency to question the infallibility of the accepted teachings. Among them are articles by Pölchen, $\frac{20}{\text{B.127}}$ Nickel, $\frac{20}{\text{B.127}}$ Hanau, $\frac{54}{\text{No.9}}$ and Hahn. $\frac{69}{\text{Jan.28}}$ Pölchen has discovered that, in six cases supposed to be syphilitic, there was absolutely no trace of syphilis. Nickel found one case due to gumma; two pointed to inflammation of the glands of Bartholini as a cause, two to parametritis. "The other specimens of the collection noted as being syphilitic are probably ulcera clysmatica (enema) or decubitalia due to pressure of scybala."

The second annual report of the clinic for diseases of the

rectum, at the New York Post-Graduate Hospital, shows a very gratifying condition as regards the amount of material for the purposes of study. During the year 1891, 140 new cases were shown and 74 operations were done before the class. The figures, added to those of the first year, give a total of 278 cases, with 141 operations, shown at the clinic since its organization. During the last year there were 14 colotomies, 4 complete extirpations, and 3 proctotomies for stricture. The success of the effort on the part of the college to provide instruction in this special branch of surgery is the more gratifying when it is remembered that, up to the time of the establishment of this clinic, there were no facilities in America for such study, and that many Americans were deriving their only practical knowledge of these diseases and their treatment from St. Mark's Hospital, in London.

SURGICAL DISEASES OF THE GENITO-URINARY APPARATUS IN THE MALE.

By E. L. KEYES, M.D.,

AND

EUGENE FULLER, M.D.,

NEW YORK.

GENERAL LITERATURE.

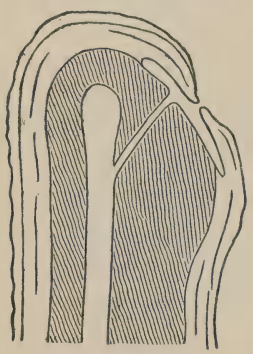
J. W. S. Gouley, of New York, $\frac{1}{\text{Nov. 28, '91}}$ appears in a long series of articles dealing with phlegmatic affections of the urinary apparatus, in which a new nomenclature is adopted, together with an original grouping of the diseases considered. There is much of interest in these articles, though no new points of practical value are brought forward.

Guyon, of Paris, $\frac{290}{\text{May 10}}$ presented a valuable article on the pathology of urinary infection to the *Congrès de Chirurgie.* The author acknowledges the aid of Albarran, Clado, and Hallé, of Paris, and Pousson, of Bordeaux. The different varieties of germs studied are mentioned, and the following conclusions drawn: Many of the germs are found to cause no chemical change in the urine. They may be introduced directly along the urethra into the bladder, or indirectly from the blood through the kidneys. They can never be introduced spontaneously along the male urethra into the bladder when these parts are healthy, though such may be the case in the female, owing to the shortness of the urethra. Many bacteria are habitually found in the anterior urethra. In the healthy bladder it is difficult for germs, when once introduced, to find a permanent lodging-place. The factors which aid largely in the propagation of germs, when once they have been introduced into the bladder, are vesical distension, vesical congestion, stagnation of urine, traumatism of the mucous membrane, and neoplasms. Numerous experiments were made on animals by introducing various germs, by ligation of the urethra, etc., to confirm the conclusions arrived at. The pathological effect of urinary infection on the

general system is also considered. A. Pousson, of Bordeaux, [70 Feb.28] in a series of articles, considers (1) the agents of infection, their modes of penetration, and the conditions which favor their development; (2) the means of preventing infection and of combating it when once it is produced. These articles are well worthy of consideration. As Pousson was a co-operator with Guyon in this field, their conclusions, are, naturally, similar. J. P. Bryson, of St. Louis, [245 Sept.] claims to have almost eliminated urinary chill and fever from his practice by means of scrupulous antiseptic precautions.

DISEASES OF THE PENIS.

Deformities.—E. Loumeau, of Bordeaux, [188 Apr.17] calls attention to a deformity of the meatus where there are two openings, an upper and a lower one, representing, as it were, a figure-of-eight. The upper one usually ends in a *cul-de-sac*, the lower one only being connected with the urethra. This deformity does not appear to be very rare. Wiesmann [214 Feb.] records a case of rare deformity which he calls "Epispadia Glandis." (See illustration.)



EPISPADIA GLANDIS.
(*Correspondenzblatt für Schweizer Aerzte.*)

Hypospadias.—A. Bidder, of Berlin, [69 Mar.16,May 5] and Landerer, [301 B.32,H.5] both independently advocate a new and similar operative procedure for the cure of hypospadias, by utilizing skin-flaps from the scrotum. Both of these authors admit obtaining the idea of the operation from the article of Rosenberger [2041 '91] on a new method of operating for epispadia. H. Hamilton, of Harrisburg, Pa., [101 Aug.] has translated Bidder's first article. The first case was only a partial success, but for the second one he claims a satisfactory result. The following figures, taken from Bidder's article, will help to demonstrate the method. Figure 1 shows the two parallel denuded strips which extend from the glans well down on to the scrotum, the urinary orifice, *b*, marking the middle of the denuded area. Figure 2 shows the penis bent forward on to the scrotum, the opposing denuded edges being brought together and held in close apposition by sutures (Figure 3). After firm union has taken place along the original denuded edges, a still further flap of scrotal tissue is dis-

sected up and the penis raised (Figure 4). This fresh flap of scrotal tissue is now folded back at the glans and sutured along its free edge (Figure 5). The scrotal space left by the removal of this last flap is covered in by bringing together its edges by sutures. [The objection to this operation, in the minds of the editors, lies in the fact that a hairy epithelial surface is made to form the new

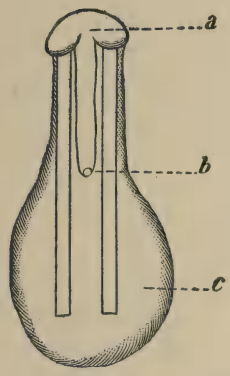


FIG. 1.

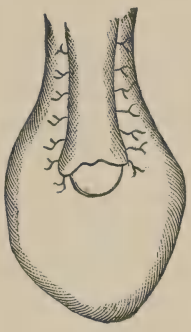


FIG. 2.

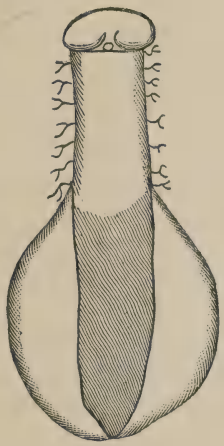


FIG. 4.

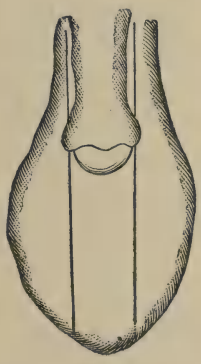


FIG. 3.

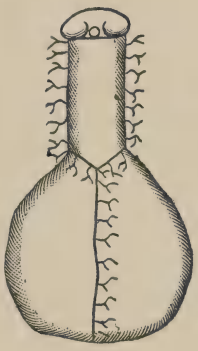


FIG. 5.

BIDDER'S OPERATION FOR HYPOSPADIAS.
a, glans penis; *b*, urinary orifice; *c*, scrotum.
(*Deutsche medicinische Wochenschrift.*)

urethra. Under such conditions hairs become foci of phosphatic deposits and fermentation. Consequently the destruction of the hair-follicles by electrolysis before the operation would seem advisable.]

Displacement.—Kourbatof $\frac{1042}{\text{No.2}}$ records a case of displacement of the penis into the scrotum; the accident occurred during a fight, the penis being seized in a violent manner. Much swelling of the

parts, with inability to pass urine, ensued. A free incision into the scrotum was made and the penis replaced.

G. F. Lydston, of Chicago, $^{161}_{\text{July}}$ publishes several cases of circumscribed chronic inflammation of the corpora cavernosa. No one has as yet advanced any satisfactory treatment for this rare and troublesome condition.

Gout of the Penis.—Sir D. Duckworth, of London, $^{2}_{\text{Jan.16}}$ describes a case of obstinate gout where, during the attack (the disease involved the penis), continuous priapism resulted, which lasted for twenty-one days. The author believed the pathology of the attack to be thrombosis in the corpora cavernosa.

DISEASES OF THE SCROTUM.

Cancer of the Scrotum in Chimney-Sweeps and Others.—H. T. Butlin, of London, $^{2}_{\text{June 25}}$ in a series of very scholarly and exhaustive articles, shows that scrotal cancer in chimney-sweeps is not on the decline in England, as has been commonly supposed. He finds that chimney-sweeps of other countries, probably owing to differences in habit and dress, are practically exempt from this disease. The author also reports and refers to several cases among these people where the cancer seemed to be primary in the inguinal glands. W. Roger Williams, of London, $^{2}_{\text{July 9}}$ however, is inclined to consider this form of cancer on the decrease and to question Butlin's figures and statistics.

Dermoid Cyst of the Scrotum.—Reclus, $^{2042}_{\text{July 20}}$ reports a case of this disease. The tumor was removed.

DISEASES OF THE TESTICLE AND CORD.

Torsion of the Spermatic Cord With Strangulation of the Testicle.—Thomas Bryant, of London, $^{2}_{\text{Feb.27}}$ calls attention to this condition, which he found in a boy of 15 years with an imperfectly descended testicle. The case was supposed to be one of strangulated hernia. An exploratory operation, however, showed a tight twisting of the spermatic cord and strangulation of the testicle. Gangrene had not set in, as the accident was very recent. The author refers also to a similar case reported by G. Nash, of South Devon. Since Bryant has called attention to this accident, N. Davies-Colley, of London $^{2}_{\text{Apr.16}}$; H. Herbert Page $^{6}_{\text{July 30}}$; H. Gervais, of Breslau $^{57}_{\text{May 1}}$; and D. Bevan, of Philadelphia, reporting Keen's

case, [9 Apr.30] have all recorded similar cases occurring in boys and young adults, in connection, apparently, with partial descent of the testicle. Such an accident is probably not as rare as Bryant supposed when he wrote his article.

Epididymitis.—George E. Brewer, of New York, [245 Jan.] advocates the dry poultice, which consists of cotton-wool with an outer layer of impervious rubber tissue, as a packing for the testicle in acute epididymitis. Horovitz [84 Nos.2,3] states that, in certain cases of gonorrhœal epididymitis, localized pelvic peritonitis appears as an accompaniment, the infection extending from the spermatic cord. This condition may be acute and disappear, or it may persist as chronic pelvic peritonitis.

Tunica Vaginalis.—F. Regnault, of Paris, [100 July 30] appears in an article on adhesions of the tunica vaginalis to the testicle. The writer concludes that chronic plastic inflammation of this sac is very frequent, one man in three on an average being afflicted; that the usual cause is a former gonorrhœa; that this condition may develop from a gonorrhœa without a concomitant epididymitis; that the diagnostic signs are often wanting, the autopsy alone affording a demonstration. The author queries whether this condition, when general and intense by reason of pressure and contraction on the seminiferous ducts, may not often be a cause of sterility. He also thinks that a slight degree of this inflammation may serve as a cause of hydrocele.

Berger, of Paris [2042 Dec.16,'91] reports a case of death from the injection of a small amount of a 2-per-cent. solution of cocaine into the tunica vaginalis previous to injecting iodine. Chobaut [211 Mar.15] likewise reports severe symptoms following a similar procedure. [After all the accidents reported from this drug, it would seem unjustifiable to use it in this manner.]

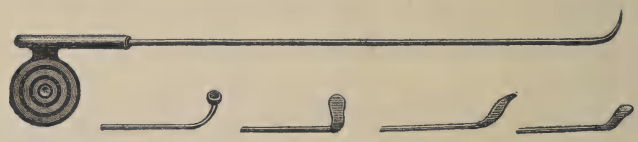
DISEASES OF THE SEMINAL VESICLES.

O. V. Petersen, of St. Petersburg, [586 No.18] publishes a paper on gonorrhœal inflammation of the seminal vesicles. He records a case occurring in his practice, where the inflammation of the organ was so acute that it presented, on rectal palpation, a tense, elastic swelling the size of a goose-egg. Anodynes and bits of ice inserted into the rectum are the chief points of treatment that the author relies upon in the acute stage. [Such an acute

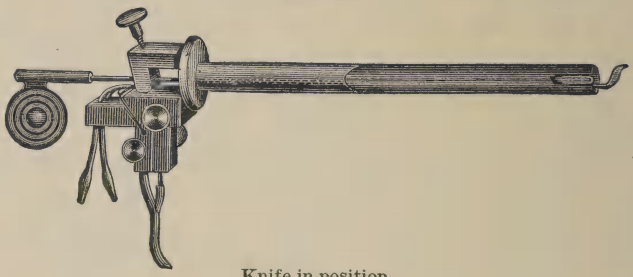
case as the one related by Petersen must be rare. Subacute and chronic cases of this affection, in the editors' opinion, are quite numerous and present a field for further research.]

DISEASES OF THE URETHRA.

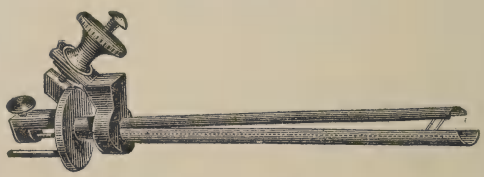
Malformations.—C. H. Voorhies, of New York, [59 Mar.12] reports a case of absence of a portion of the urethra with occlusion, in the case of a child born with a malformed penis. Voorhies was forced to make a cut of some depth before the prostatic portion of



Knives.



Knife in position.



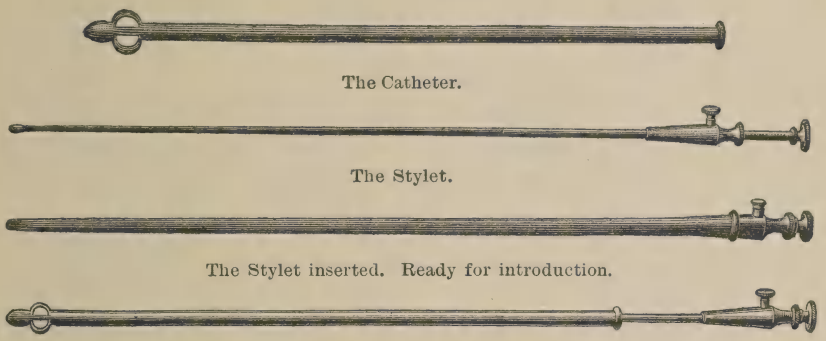
OBERLÄNDER'S DILATING URETHROSCOPE.
(*Archiv für Dermatologie und Syphilis.*)

the urethra, which was normally formed, was exposed and the vesical tension relieved.

Urethroscopy.—Oberländer, of Dresden, [45 p.365] in an exhaustive article, considers the improvements in electro-urethroscopic instruments and their uses. He advocates large-sized tubes. For urethras where the meatus is narrow, an instrument with a segmented tube has been devised by the author. A screw at the external end can be made to separate these segments as widely as the urethra will allow. Oberländer also shows how the electric illuminating current, in connection with these urethroscopes, can be

utilized for either galvano-cautery or electrolysis. Small knives for use in connection with the urethroscope are exhibited. These knives are for cutting strictures, the urethrotome being discarded. Numerous small incisions are recommended, rather than one deep one, in performing internal urethrotomy. [These instruments are certainly very ingenious, but probably rather too intricate for very general use. It is also a question whether one, armed with all these devices, would not be very likely to err on the side of over-treating the maladies of the anterior urethra. The effectiveness of his method of treating anterior stricture with the urethroscopic knives is yet to be tested.]

Instruments.—Malécot, of Paris, $\frac{100}{\text{May } 12}$ exhibits a "*Sonde à demeure*," which fixes itself by means of the elastic spring of the



The Catheter.

The Stylet.

The Stylet inserted. Ready for introduction.

Withdrawing the Stylet.

MALÉCOT'S "SONDE À DEMEURE."
(*Gazette des Hôpitaux.*)

rubber about the eye of the instrument, which is introduced on a whalebone stylet, which, when inserted, obliterates the elastic spring of the catheter, allowing it to slip easily along the urethra. It is apparently practical and certainly worthy of trial. The above illustrations serve as a demonstration.

Gonorrhœa.—Neisser, of Breslau, $\frac{3}{\text{Sept. } 24}$ reported, at the International Congress of Dermatology and Syphilis held at Vienna, his latest conclusions regarding the treatment of gonorrhœa. He states that what makes gonorrhœa hard to cure is the fact that the germs do not remain attached to the surface epithelium, but that they frequently find their way to the very deepest layers, becoming imbedded there, and thus often act as agents for the further communication of the disease, months and even years after

the original affection. Strong caustic or very irritating antiseptic injections are discouraged, as by their use lesions of the mucous membrane are produced, which, provided, of course, the germs have not all been destroyed by the strong injections,—a rather unlikely result,—facilitate the entrance of the remaining germs to the deeper layers of epithelium. The use of the endoscope and, in fact, of instruments generally, in the acute stage, is not advised. Frequent, voluminous irrigations of the anterior urethra with weak antiseptic solutions are recommended in the acute stage, the great endeavor being to stamp out the disease while it is confined to the anterior urethra. The agents which Neisser especially relies upon to accomplish this are solutions of nitrate of silver (1–4000 to 1–2000), 1-per-cent. solution of ichthyol, and solutions of corrosive sublimate (1–30,000 to 1–20,000). Finger, of Vienna, $^{3}_{\text{Sept.24}}$ in discussing Neisser's paper, asserts that, if once the germs have penetrated any deeper than the surface layers of the epithelium, the weak solutions of nitrate of silver which Neisser recommends have no longer sufficient power of penetration to reach and destroy them. In this latter condition Finger recommends strong solutions,—up to 5 per cent., or even 10 per cent.

Jadassohn, of Breslau, $^{69}_{\text{Sept.22}}$ an assistant in Neisser's clinic, publishes an article on the treatment of gonorrhœa by means of ichthyol, and advocates its use. Manganotti $^{589}_{\text{No.85}}$ also advocates 1- to 3-per-cent. solutions of ichthyol in gonorrhœa, especially in the acute stage. The injections are not painful and do not provoke any inflammatory reaction.

Reverdin, of Geneva, $^{70}_{\text{Jan. 26}}$ recommends the treatment of acute gonorrhœa by means of irrigations, twice a day, of a solution of permanganate of potash, 1–5000. About a quart of such a solution, at a temperature of about 100° F. (37.8° C.), should be used with a fountain syringe through a catheter, passed into the penis as far as the bulb. [In America, this method of irrigation, chiefly with solutions of corrosive sublimate, by means of a catheter passed in as far as the bulb, has been largely discarded, as the deeper parts have apparently been congested by it. Perhaps, however, with this weak solution of permanganate of potash, such disagreeable complications need not be so much feared.] Janet, of Paris, $^{3}_{\text{Apr.27}}$ also advocates permanganate of potash in gonorrhœa, in solutions of from 1–4000 to 1–100, according to circumstances. He

claims that the disease can be aborted by frequent irrigations of solutions of this substance in strengths of from 1–4000 to 1–1000. Trzcinski, of Warsaw, $^{45}_{H.11}$ believes that almost all cases of gonorrhœa, in spite of all forms of treatment, invade the posterior urethra. Treatment, therefore, directed wholly to the anterior urethra, is liable to be unsatisfactory. The writer consequently washes out, by means of a small olive-pointed catheter and a bulb syringe, once a day, the whole length of the urethra as well as the bladder. He begins with a 1-to-8000 solution of nitrate of silver, which solution is gradually increased in strength up to 1–3000. Good results are claimed for this treatment. Szadek, of Kieff, Russia, corresponding editor, $^{673}_{Apr.}$ recommends a 1- to 2-per-cent. solution of resorcin as an injection in acute gonorrhœa. Schwengers $^{28}_{No.3}$ treats chronic gonorrhœa of the anterior and posterior urethra by a 25-per-cent. solution of resorcin in glycerin. The endoscope is used to apply this to the anterior urethra, the posterior urethra being medicated by means of Ultzmann's syringe.

Vaughan, of New York, $^{1}_{Apr.30}$ thinks well of a plasment of dermatol, applied along the urethra, in acute gonorrhœa.

Stricture.—Much has been written this year on resection of the urethra as a radical measure in the cure of certain aggravated forms of deep urethral stricture, chiefly of traumatic origin. Most of this work has been done by French authors. Guyon, of Paris, $^{266}_{May}$ in an excellent article on partial resection of the perineal urethra, prefers this procedure to total resection in all suitable cases, for the following reasons: 1. In most cases of traumatism and of gonorrhœal inflammation, the roof of the urethra escapes in a great measure the subsequent lesions, the dense cicatrices being found in connection with the urethral floor. 2. If, in such instances, there is complete resection of the urethra, the elasticity of the tissues causes a much greater retraction between the resected edges of the urethra than could otherwise take place. 3. In partial resection, the subsequent cicatricial contraction, in connection with the floor of the urethra, the roof not being disturbed, tends to increase, rather than diminish, the calibre of the urethra at that point. Although excessive separation in partial resection does not take place between the cut edges of the urethra, yet these edges are frequently too far apart to be brought together by sutures, in which conditions Guyon allows the gap to be filled up by soft

tissues, as he considers an extensive cicatrix made up of such elements far better than the leaving of any inodular urethral tissue. In these cases, the soft tissues between the urethra and the skin are brought into close apposition by tiers of deep sutures, a "*sonde à demeure*" serving to drain the bladder, the hope being to obtain union by first intention, which result Guyon has secured in several of his cases. When, however, the cut edges of the urethra can be brought into apposition, the author advises sutures, which should be inserted transversely and on the same plane, care being taken not to have them involve the mucous membrane. If much tension is brought to bear on the sutures they easily pull out of their urethral attachments; therefore, sutures should be used only in cases where there is little or no tension.

Albarran, of Paris, $\frac{3}{\text{May 7}}$ reports that he has operated five times in cases of gonorrhœal stricture by resection of the urethra, partial resection, as advocated by Guyon, being resorted to in all cases where it was practicable; otherwise total resection. In all these cases the reason for resorting to resection was the previous failure of urethrotomy and dilatation, together with the existence of perineal induration or fistulæ. The result in all cases was a cure in from eighteen to twenty-four days, although only partial union by first intention was obtained. These cases, at the end of from six to ten months, are all satisfactory. Albarran considers that it is much more difficult to obtain union by first intention, in the case of strictures of gonorrhœal than of traumatic origin, since in the former condition the chronic urethritis is always dangerous as a source of infection and suppuration.

Horteloup, of Paris, $\frac{3}{\text{May 18}}$ states that he has resected the urethra in eleven cases. He thinks the method is not adapted to strictures of gonorrhœal origin, but that it is good in cases of traumatism. He reports a case in which four centimetres of the urethra were removed four years ago, the patient being well at the present time. Horteloup does not advocate suture of the urethra, except in cases where the ends are near together. He reports a good result in one case where seven centimetres of urethra were removed. The author only partially closes the perineal wound. The "*sonde à demeure*" is left in only two days, when it is removed, the urine coming through the perineum. A sure and complete cure follows. Jouon, of Nantes, $\frac{3}{\text{Mar. 4}}$ and Vignard $\frac{1043}{\text{July}}$ advocate resection for trau-

matic strictures, and report favorable results. Quénu $_{\text{May 11}}^{3}$ reports a case where the operation was only a partial success. In this case, however, the bladder was foul, and the author considers that the foul urine coming in connection with the wound was the probable cause of failure in the operation. Such a condition would certainly seem to be a sufficient reason for a poor result. Wartel, of Lille, $_{\text{Aug. 5}}^{220}$ reports several cases of excision of traumatic strictures, with good results. In one of these cases the seat of the excised stricture was in the penile urethra, three centimetres of the canal being removed.

Immediate Suture of Ruptured Urethra.—G. Baring, of Birmingham, $_{\text{Dec., '91}}^{32}$ reports three cases of traumatism of the deep urethra where perineal section was immediately done and the ruptured edges of the urethra sutured. The author does not claim very good results, but hopes to do better in the future. [It is probable, however, that very good results, as compared with those of resection for stricture, are not to be expected from the cases where the radical operation is undertaken at the time of the injury, since, at that time, the vitality of all the perineal tissues is liable to be impaired, by reason of the recent traumatism and the consequent urinary infiltration.]

Perineal Urethrostomy.—Under this heading, Poncet, of Lyons, $_{\text{May 7}}^{3}$ reported, to the Sixth French Surgical Congress, five cases of stricture where the end of the urethra behind the stricture was cut off and dissected free and sutured to the cutaneous tissue of the perineum, thus giving a new outlet to the urine. [Such a procedure may be called for at times; still, if such good results as have been reported can be obtained from resection, the operation practiced by Poncet would seem to be rarely indicated.]

Excision of Stricture and Urethroplasty.—E. L. Keyes, of New York, $_{\text{Nov., '91}}^{245}$ reported a very interesting case of excision where the excised area was filled in by a graft taken from the foreskin, mention of which was made in the Annual (1892, vol iii, E–6). This case has now, after a space of two and a half years since the operation, again reported to the author. The patient states that he does not need to rely upon sounds any longer. A large, blunt, steel sound will now slip over the excised area, showing little or no indication of the previous trouble.

[The results obtained in the operative procedures just recorded,

owing to the high standing of the authors, cannot be impeached, and these results should stimulate surgery in this direction.]

Retrograde Catheterization.—Max Köhler, of Vienna, $^{8}_{\text{Aug.18}}$ in a series of articles, ably reviews this subject, giving the details of the operation, the instruments preferred, and the histories of numerous cases.

Perineal Drainage in Inveterate Stricture of the Penile Urethra.—C. Mansell Moullin, of London, $^{6}_{\text{Jan.16}}$ has noticed that, in numerous instances where perineal drainage has been resorted to for a considerable period, hard indurated strictures of the penile urethra have lost their induration and have, in fact, largely disappeared. The author suggests such a treatment for agravated cases of this condition. Thorough division of the stricture, however, would seem to be a matter of prudence as an accompaniment to this perineal drainage.

DISEASES OF THE BLADDER.

Cystoscopy.—E. Hurry Fenwick, of London, $^{26}_{\text{Apr.1}}$ gives a series of lectures on the diagnostic significance of single symptoms of urinary disease, controlled by electric cystoscopy. All the different conditions which can be diagnosticated by the electric light are recounted.

Willy Meyer, of New York, $^{1}_{\text{Jan.30}}$ publishes a series of interesting articles on the progress of cystoscopy in the last three years. In the first chapter, the various cystoscopes, with all their improvements and attachments, are considered, the author giving his preferences. Nitze's new operating cystoscope will, in the author's opinion, prove itself to be a very useful instrument. Fig. 1 represents this instrument with open blades, Fig. 2 with shut blades. These blades are opened and shut by means of the lever *b*. Nitze, himself, $^{336}_{\text{Dec.19,'91}}$ also describes this new instrument, by means of which it is claimed that one can operate with safety and success on vesical growths. The instrument can be modified so that by its aid topical applications of a caustic nature, etc., may be accurately made to any part of the vesical walls.

Robert Kutner, of Berlin, $^{69}_{\text{Nov.26,'91}}$ has devised an ingenious photographic contrivance by which he claims that the image, as reflected by the cystoscope, can be distinctly reproduced.

L. Bolton Bangs, of New York, $^{462}_{\text{Aug.}}$ in a paper on some of the

difficulties in the use of the cystoscope, relates a case where a fold in the anterior wall of the bladder was mistaken, after careful and competent examination, for a tumor. The fact that no tumor existed was proven by operation.

Supra-pubic Aspiration of the Bladder.—F. D. Sanger, of Baltimore, $\frac{1}{\text{Sept. 10}}$ records a case of death following supra-pubic aspiration. The autopsy showed an acute peritonitis, the bladder and the pelvic organs being matted together by fresh adhesions.

Eugene Fuller, of New York, $\frac{245}{\text{May}}$ records a case of enormous prostatic hypertrophy with retention, where the relief of vesical distension by means of supra-pubic aspiration was impossible,

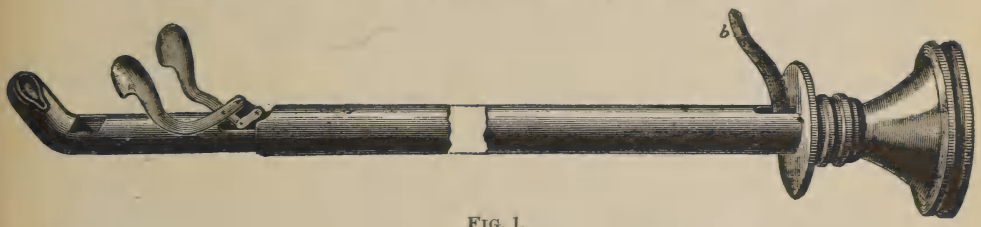


FIG. 1.

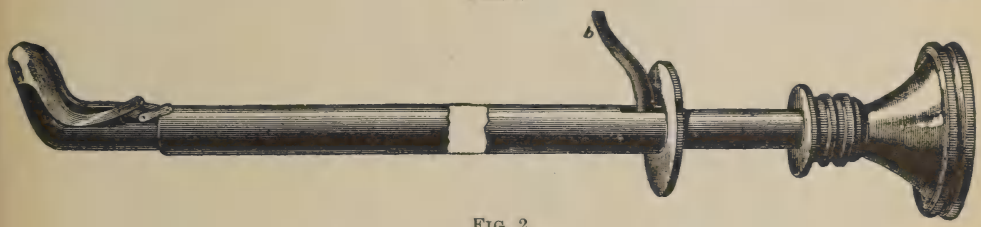


FIG. 2.
NITZE'S OPERATING CYSTOSCOPE.
(*New York Medical Journal.*)

owing to the prostatic growth. The section represented on next page will serve to illustrate the existing conditions.

S. F. Watson, of Boston, $\frac{99}{\text{Dec. 24, '91}}$ records a case of prostatic hypertrophy, with retention, where supra-pubic aspirations, rather than the catheter, were resorted to. Watson was much pleased with the results of this treatment, in the case recorded. A case of acute retention from prostatic obstruction was, a short time since, brought on from the far west to Keyes, for operative relief. This case, during the journey, had been aspirated forty-seven times. The patient's general condition was good, his urine sweet, and hardly any evidences of traumatism could be detected over the pubes. Still, of course, in the vast majority of these cases the catheter, with scrupulous antiseptic precautions, is the instrument of choice.

Injection of Fluids into the Bladder without a Catheter.—C F. Bennett, of Waterloo, Ia., $^{245}_{\text{July}}$ is authority for the statement that fluids, by means of a fountain syringe,—the nozzle being connected with the meatus,—can be made to flow into the bladder very readily and without the exercise of much pressure, provided the patient is directed to strain as if in the act of urination.

Rupture of the Bladder.—Rieder $^{4}_{\text{No.24}}$ reports a case of extra-

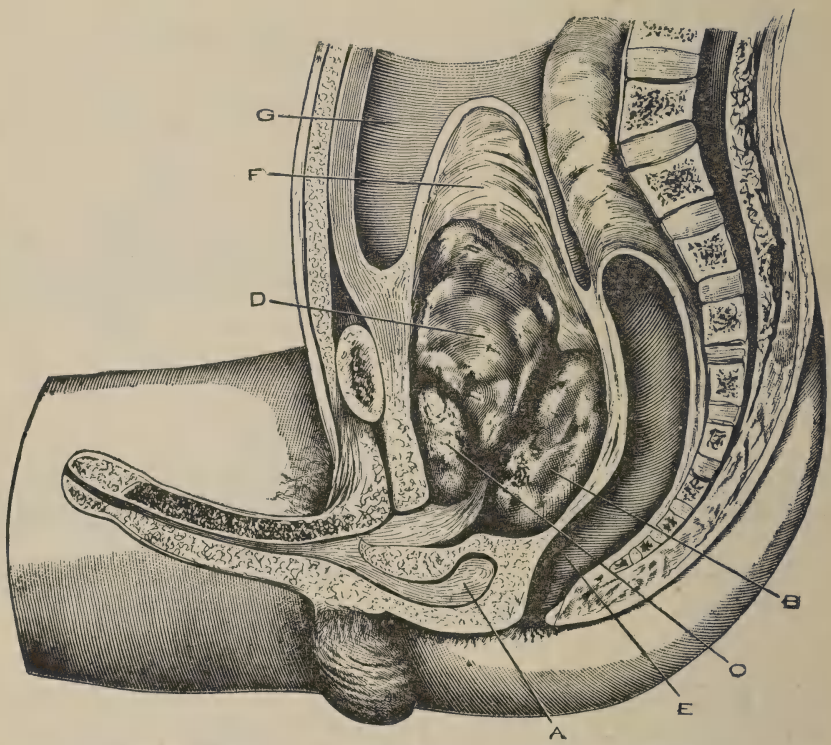


FIG. 3.—ASPIRATION FOR THE RELIEF OF VESICAL DISTENSION.

A, false passage; B, section through median hypertrophy; C, section through upper encircling prostatic fibres; D, lateral prostatic hypertrophy; E, rectum; F, bladder cavity; G, peritoneal cavity.

(*Journal of Cutaneous and Genito-Urinary Diseases.*)

peritoneal rupture of the bladder into the space of Retzius. The extravasation caused a tumor to appear, extending from the symphysis to the umbilicus, simulating very closely an overdistended bladder. Guyon, of Paris, $^{100}_{\text{Nov.24,'91}}$ in an instructive article on the collection of fluids in the prevesical space, calls attention to the fact illustrated by the case just quoted; that is, that fluids in this space simulate closely the appearance of vesical distension, and often lead to an error in diagnosis. This is because the fluids

burrow upward toward the umbilicus behind the recti muscles. When suppuration takes place, under these circumstances, it finds its way to the surface between the recti muscles, its advent being announced by the appearance of surface phlegmon. Guyon cites cases to verify his assertions. The termination by resolution of these cases is quite frequent.

Wyeth, of New York, [1 May 21] records a case of perforating ulcer of the bladder, in which the exact condition of affairs was revealed at the autopsy. Such cases are quite rare.

Stone.—Surgeon-major J. Forbes Keith, of India, [239 Dec. 1] publishes a report on the complete abandonment of the operation for removing calculi entire from the bladder, and the methods employed, at the civil hospital of Hyderabad, Sindh. Major Keith states that he has almost completely abandoned the aspirator in removing *débris*, the catheter taking its place. His procedure is, in the first place, to crush the stone into very fine particles, almost of the consistency of dust or sand, before attempting removal. To do this, a large-sized lithotrite is at first introduced to accomplish the coarse crushing; then this instrument is removed and a light lithotrite, whose shaft is much smaller than the calibre of the urethra, is inserted and not removed, unless it becomes clogged, until complete pulverization of the stone is effected. An instrument with a shaft much smaller than the calibre of the urethra is advised for the second part of the crushing, for the reason that the fine powder tends gradually, probably owing to the constant movement of the male blade of the lithotrite, to work its way out of the bladder and into the urethra, eventually appearing even at the meatus. This powder thus tends to form in the urethra a packing around the instrument, and, unless there is considerable room, serious clogging and impaction may result. After the stone has been thoroughly pulverized, a good-sized catheter is introduced, and the bladder continuously flushed out and refilled again until the fluid coming away is perfectly clear. The objection to the aspirator, in the author's opinion, is that the walls of the bladder are, by its use, subjected to needless violence; that much of the *débris* is, by this instrument, thrown backward and forward many times before it finally settles safely into the glass receptacle, and that, by violent aspiration, there is a tendency for the *débris* to become, as it were, plastered on to the walls of the bladder, from whence its removal

is sometimes troublesome; and, by reason of the blood that collects in the glass bulb, it is often difficult to tell when the bladder has been washed clean. The writer also holds that the natural expulsive force of the bladder is generally sufficient, without the aid of the elastic-suction force of the aspirator, to accomplish evacuation. The irrigation stop-cock made by Leiter, of Vienna, attached to the end of the catheter by rubber tubings, is recommended as an aid in thoroughly flushing out the bladder by means of the catheter.

In the case of very large stones, where the urethra is narrow, or where the bladder-walls are in close contact with the stone, neither the retention of urine nor the introduction of fluid being tolerated, Major Keith advocates perineal lithotrity. The author found that, in operating on females, no matter how large the stone, provided, of course, the blades of the lithotrite could grapple it, he could satisfactorily remove from a contracted irritable bladder, no fluid being present, all *débris* without injuring the vesical walls. He, therefore, encountering a similar condition in the male, introduced a staff along the urethra, and by means of an external urethrotomy divided the membranous urethra only, the prostate and prostatic urethra not being disturbed. He then found that a very large sized, strong lithotrite—the same as he had used in female cases—could be very readily introduced, and an operation, exactly similar to that performed on females, was accomplished with very little resulting disturbance. In these cases the author reports that the urine comes through the perineal wound but little, if at all, and that convalescence is not perceptibly delayed by the perineal incision. Keith has had a perineal lithotrite made especially under his directions. Seventy-six such operations, with two deaths, are recorded by the writer as his result with this procedure.

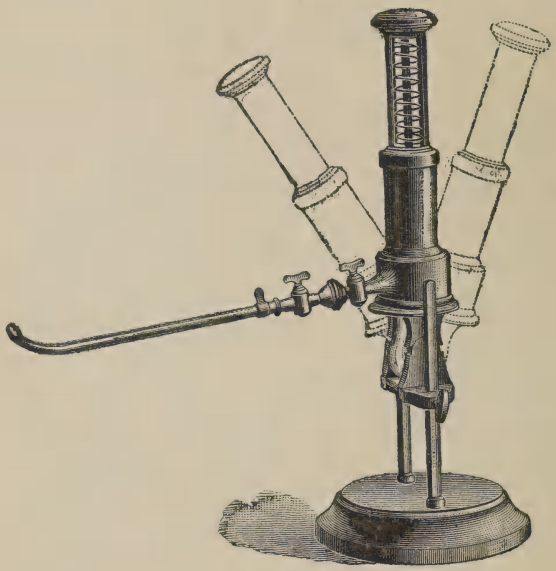
For stones so large that no lithotrite can engage them with locked jaws, the hammer and chisel method is advocated; the perineal incision of the membranous urethra being made as in the previous method. A large-sized lithotomy forceps, with concaved jaws, is introduced, by which the stone is seized and held firmly while it is broken into coarse fragments by a hammer and chisel. Then the regular perineal lithotrite is introduced, and the operation just previously described accomplishes the entire removal of the stone. Twelve such cases, with four deaths, are reported by

the author. In one case requiring this procedure, seventeen ounces of *débris* were removed. The same author $\frac{239}{\text{Feb.1}}$ records another method for crushing calculi too large for the largest lithotrites. Here the perineal incision is resorted to, the largest-sized lithotrite introduced, the blades of the instrument separated to their utmost, and as much of the stone as possible included in the grasp. The female blade and the shaft of the instrument are then held firmly and several sharp raps with a hammer are made on the end of the male blade. By this procedure the jaws of the lithotrite are driven together so that they can be locked, and thus the stone is gradually reduced in size until it can be managed in the usual manner. The views of Keith, and of other Indian surgeons on stone, are valuable and worthy of full consideration, as these gentlemen have practically an unlimited field for observation and experiment as regards vesical calculi. Guyon, according to Reginald Harrison, of London, $\frac{6}{\text{July 2}}$ adopts much the same procedure as Keith in cases of ordinary lithotrity; that is to say, the stone is crushed until it is practically pulverized before evacuation is attempted. Then the *débris* is removed through a catheter, the bladder being repeatedly flushed out with a borated solution until the fluid comes away perfectly clear.

F. A. Southam, of Manchester, $\frac{6}{\text{Apr.23}}$ reports five cases of lithotrity in boys ranging from 1 to 6 years, with recovery in all instances. The author finds that, by raising the pelvis somewhat, so that the stone may gravitate backward, the operation is very easy, much more so, in fact, than is usual in dealing with adults, since in boys there is an entire absence of any prostatic pouch. The bladder in these small subjects has also been found to be very tolerant. Jordan Lloyd, of Birmingham, $\frac{32}{\text{Apr.}}$ reports forty-four consecutive cases of stone in the bladder treated by operation, without a death. Von Dittel, of Vienna, $\frac{8}{\text{No.17}}$ reports another hundred operations for stone in the bladder, six hundred cases having been already reported by him. Three of these represented the median operation, sixty-seven litholapaxy, and thirty supra-pubic cystotomy. The article is carefully and instructively written, the chief points in each case being enumerated. Thos. H. Manley, of New York, $\frac{101}{\text{Apr.}}$ reports a rare case of urethral calculus in a child. There were symptoms of retention, with great vesical tenesmus. Instruments were passed along the urethra into the bladder, without detecting

any obstruction. Perineal section was performed with entire temporary relief, as long as the wound remained open and allowed the urine to drain out in that direction. When the wound closed, all the symptoms returned. In making a second and more anterior perineal cut, three flattened, spheroidal calculi were discovered and removed. These stones seemed to be largely imbedded in the floor of the urethra. In such a case as this the endoscope might have led to the detection of the trouble.

New Instruments.—George Chismore, of San Francisco, $^{9}_{\text{July 9}}$ calls attention to his new instrument, which combines in one a



SOMMERVILLE'S ASPIRATOR.
(*British Medical Journal.*)

lithotrite and an evacuating tube with a wash-bottle attachment. James Sommerville, of India, $^{2}_{\text{Aug. 27}}$ has invented an aspirator which is made entirely of metal. This instrument is designed for use in India and hot climates generally, in which countries rubber goods are very perishable. A syringe and piston arrangement is made to take the place of the rubber bulb. A spring throws up the piston after it has been depressed. The cannula is connected with the syringe by two stop-cocks, there being a ball-and-socket joint between to afford the requisite freedom of motion. The glass-bulb receptacle is below the piston. [This instrument is ingenious and apparently of value.]

Horteloup, of Paris, [73 June 18] in an article on the supra-pubic operation, in which the history of this procedure is traced from early times, described an instrument of his own invention, which is designed to puncture the vesical wall after it is exposed, and then to hold up and sustain that viscus during the latter stages of the operation. The thumb goes through the ring A, the index and middle fingers through at B B. The sharp point, F, then punctures the bladder-wall (Fig. 1). Pressure on the sliding shaft is now made at A, and the two arms of the instrument separate at right angles (Fig. 2) and are held in this position by the screw C (Fig. 1).

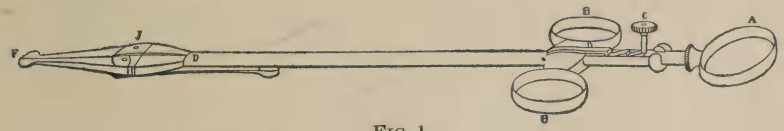


FIG. 1.

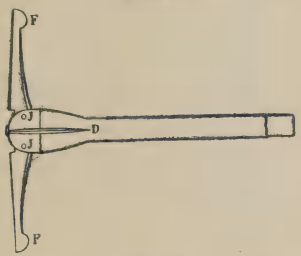


FIG. 2.

HORTELOUP'S SUPRA-PUBIC VESICAL PERFORATOR AND SUPPORTER.
(*Le Progrès Médical.*)

Immediate suture of the bladder after supra-pubic cystotomy is advocated by F. Legueu, of Paris, [100 No. 81] in cases of children. The author asserts that in 83.33 per cent. of such cases union by first intention takes place. The good results attained in children as compared with adults are accounted for by the fact that in children little bleeding follows incision of the vesical walls, since development of the perivesical and periprostatic plexuses has not as yet taken place; hence, distension of the bladder from subsequent blood-clot and bleeding into the prevesical space, the accidents mostly to be feared, are not usual.

Vesical Tuberculosis.—James Bell, of Montreal [245 Aug.]; Lewis S. Pilcher, of Brooklyn [1 Mar. 5]; and L. Bolton Bangs, of New York, [245 May] all report cases of this disease treated after the method advocated by Reverdin, of supra-pubic cystotomy with thorough curetting and

drainage for a considerable interval. In a majority of these cases sufficient amelioration of suffering was attained to warrant the operation, and, in quite a number of them, a cure—for the time being, at least—was effected. In a minority of these cases little benefit resulted.

Vesical Tumors.—E. L. Keyes, of New York, [155 Aug.] reports a case of relapsing villous papilloma. The chief interest in this case lies in the attempt to perform a second supra-pubic operation, after an interval of six years. When the second attempt was made, the peritoneum, which had caused no trouble at the first operation, was found drawn forward almost to the pubic bone, and firmly adherent. For this reason the supra-pubic wound was closed without opening the bladder, and the relapsing growth removed by the perineal route. Appended to this article is a table enumerating the reported cases of operation for removal of papilloma of the bladder. Phocas, of Lille, [3 Apr.30] in an article on tumors of the bladder in children, discourages operative attempts, in case they are malignant, since as yet no one has published successful results in such instances.

Extirpation of the Bladder.—Pawlik of Prague, [84 Nov.7,'91] reports the successful termination of his case of total extirpation of the bladder. The preliminary steps in this procedure were begun in 1888, by fastening the cut-off ends of the ureters to the vagina, so that the urine might flow into that organ. After a time the bladder was removed, and now the vagina takes the place of the bladder in, it is claimed, quite a satisfactory manner.

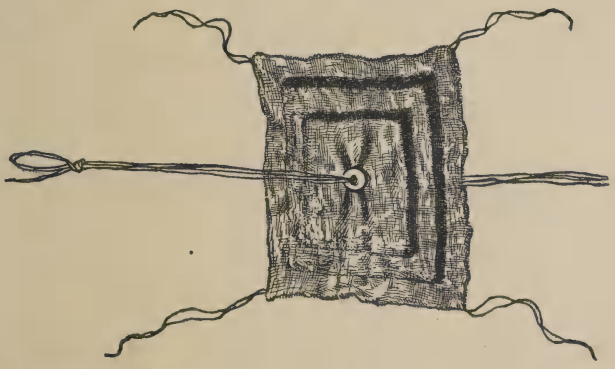
Sacculated Bladder.—An interesting case of this condition is reported by A. T. Cabot, of Boston. [99 Aug.25]

DISEASES OF THE PROSTATE.

Prostatectomy.—E. L. Keyes, of New York, [59 Sept.17] suggests an efficient method of controlling hæmorrhage after supra-pubic prostatectomy. This is accomplished by means of a pad, or tampon, of gauze, which is put through the supra-pubic opening into the bladder, and drawn down firmly against the bleeding surface by means of a cord attachment, which passes out along the urethra or through a perineal opening, and is securely fastened at its exit to a transversely-placed piece of tubing or roll of gauze. At the end of twenty-four hours or so, the hæmorrhage having ceased,

this tampon is removed through the supra-pubic opening. The author's exact description of this tampon, together with the illustration, is inserted.

"The tampon is made of bichloride gauze. A square of four thicknesses of gauze is first cut, the length of each side being about six inches. Upon this are placed eight thicknesses of gauze, cut square, each side measuring four inches, and upon this eight other thicknesses of gauze, also square, the sides measuring three inches. Centrally, upon the three-inch pad, a small white shirt-button is tied by stout silk ligature, transfixing the pad and tied upon the six-inch square surface. This central button also has a piece of silk attached to it, running out freely in the direction away from the three-inch surface. This is to facilitate extraction. Each of



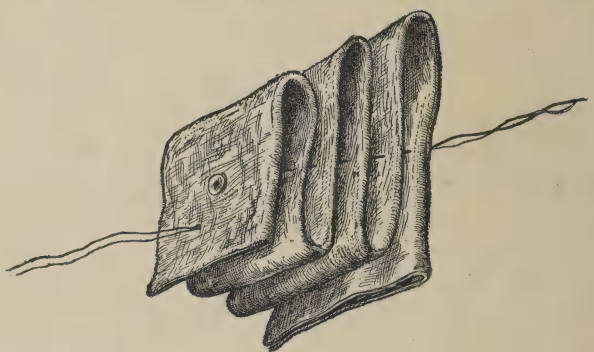
KEYES'S PAD FOR CONTROLLING HÆMORRHAGE AFTER PROSTATECTOMY.
(*Medical Record.*)

the corners of the six-inch pad is stoutly tied with a piece of silk, and the silk from each of these four corners its knotted at its end into a double knot, while the silk running out backward from the button is tied with a single knot, for the purpose of distinguishing which is which when making the extraction; although, practically, it will be found that they must all be made taut and pulled upon all together in order to effect removal with the greatest care and facility."

A. T. Cabot, of Boston, $\frac{59}{\text{Sept.17}}$ on adopting the tampon arrangement suggested by Keyes, found that, although the method was very efficacious in stopping hæmorrhage, yet the removal of the tampon was attended with difficulty. He therefore suggested that the tampon be made of one piece of gauze, so folded that traction

on one thread, the thread securing fixation being loosened, gradually unfolded and removed the whole plug. This arrangement seems very feasible. The accompanying cut illustrates Cabot's idea.

C. Mansell-Moullin, of London, [6] June 4 in a series of articles, reviews the operative literature of the prostate in a very thorough manner. In concluding the articles the following questions are discussed: the recurrence of the hypertrophy, the return of the vesical tonicity after it has apparently been lost, and the risk involved in operation. In reference to the first of these questions, the greater portion of the evidence collected goes to show that a return of the hypertrophy is not to be expected, and, in fact, that at times atrophic changes ensue after the operation. In two cases



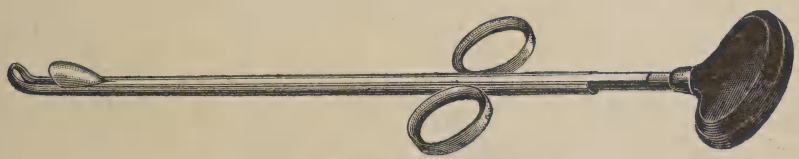
CABOT'S PAD FOR CONTROLLING HÆMORRHAGE AFTER PROSTATECTOMY.
(*Medical Record.*)

only, one of Benno Schmidt's [2043] '86 and one of Guyon's, [2044] has a recurrence of the hypertrophy been noted. In reference to the second question, experience seems to show that in the majority of cases the vesical tonicity is regained, provided the prostatic obstruction is thoroughly removed. In considering the risk involved, the mortality by the perineal route was found to be about 1 in 12 to 13, while by the supra-pubic operation it was 1 in 5 or 6. [The editors wish here to emphasize the fact that only the lesser grades of prostatic hypertrophy can be relieved by the perineal operation; consequently the cases in which the supra-pubic operation is resorted to are of a much more aggravated type; the general vitality is lower, and in many of them the kidneys have been secondarily affected. It follows, therefore, as a matter of course, that the statistics collected by Moullin would show a much greater mor-

tality for the supra-pubic cases. This explanation is made in order that the casual observer may not be led, by the mere consideration of the mortality statistics, to think that the choice of operative procedures favors the perineal route, when in reality there is no choice; the supra-pubic operation, and that alone, is indicated and necessary in all cases of extensive general hypertrophy.]

A. T. Norton, of England, $\frac{22}{\text{Jan. 27}}$ has devised a prostatome. The instrument is advocated as useful in removing the middle lobe in cases of perineal prostatectomy, and is apparently of value.

Prostatic Hypertrophy, a Localized Pathological Process.—Casper, of Berlin, $\frac{4}{\text{No. 5}}$ asserts that prostatic hypertrophy, though at times associated with a senile sclerotic condition of the blood-vessels of the whole genito-urinary apparatus, has no connection, other than an accidental one, with that general condition. The author examined the bodies of twenty-eight men over 50 years of age. In the first twenty-four, the prostate was enlarged and the



NORTON'S PROSTATOME.
(*Medical Press and Circular.*)

aorta atheromatous. In two cases only was a general senile sclerosis of the urinary organs found associated with prostatic hypertrophy. This article refutes the theory, put forward by Guyon and Launois, that prostatic hypertrophy is but a part of a general senile sclerosis of the urinary organs.

DISEASES OF THE URETERS.

Grafting the Ureters.—Trekaki, of Paris, $\frac{100}{\text{June 11}}$ in a very complete article, reviews all the literature on this subject. By means of plastic surgical operations, various experimenters are shown to have grafted the ends of the ureters to the mucous membrane of the bladder, penis, vagina, and intestine, and also to the cuticle of the abdomen. The author considers the intestine an unfavorable location for a graft, since the numerous bacteria existing there readily, under such circumstances, work their way up into the pelvis of the kidney, thus setting up an inflammation which, usually,

speedily terminates fatally. In females, the vagina, as illustrated by Pawlik's case, reference to which has already been made, seems to offer a good site for a graft. In most instances the author prefers to graft the ureteral end to the abdominal cuticle. The cases of two dogs were reported by the author to the Anatomical Society of Paris. $^{7}_{\text{No. 5}}$ In one of these animals both ureters were grafted to the abdominal cuticle, the second graft being made ten days after the first. The dog died twenty-eight days after the second grafting. The autopsy showed renal suppuration in connection with the second grafting; the graft itself, however, was found to have healed perfectly to the cuticle. The first graft, together with the corresponding kidney, was found to be in good condition. In the second case, but one ureter was grafted to the skin of the abdomen, the other being left intact. That case was still alive and apparently well at the time of the report.

F. Kammerer, of New York, $^{1}_{\text{July 2}}$ records two cases where he wounded the ureter in abdominal operations, necessitating the removal, as a secondary operation, of the corresponding kidney. Both cases recovered.

P. Reichel, of Wurzburg, $^{336}_{\text{Aug. 13}}$ calls attention to a case of inguinal hernia where the hernial sac contained a knuckle of prolapsed ureter, marked hydronephrosis resulting as a consequence.

DISEASES OF THE KIDNEY.

Conditions Simulating Renal Calculus.—Henry Morris, of London, $^{2}_{\text{Apr. 30}}$ in three lectures, gives the surgical histories of twenty-eight cases occurring in his practice, where operative procedures were undertaken with the prospect of discovering and removing kidney stone, and in which no calculi were found. In twenty-six of these cases other pathological conditions existed which accounted for the symptoms. In two of the cases, which were among the author's earlier ones, the existing renal calculus was not discovered at the time of the operation. Such an oversight, however, the author does not now consider at all probable, owing to the very thorough manipulation to which he subjects the kidney at the present time.

In searching for stone, Morris now advocates, in case nothing can be detected by thoroughly feeling over the kidney and its pelvis, after they have been stripped of the perinephritic tissues,

making a longitudinal incision along the convex edge of the organ, thus admitting the forefinger into the pelvis. Then, by pinching successively every portion of the organ between the forefinger and the thumb, any existing calculus, no matter how small, can be detected. After this manipulation the kidney wound is closed by catgut sutures. In the 26 cases where there was no stone the conditions simulating calculus were as follow: (1) tuberculous nephritis and pyelonephritis, 2 cases; (2) abscess of the kidney, 5 cases; (3) the effects of former perinephritis caused by sprains or other injuries to the back, 4 cases; (4) movable kidney, 2 cases; (5) abscess of the prostate, 1 case; (6) prostatic calculus, 1 case; (7) calculus impacted in the lower end of the ureter, 1 case; (8) effects of a stone which had passed along the ureter, 1 case; (9) renal calculus, simulated by disease in the neighboring organs, such as cæcum and stomach, 2 cases; (10) spinal disease which had caused perinephritic suppuration, 1 case; and (11) no sufficient cause discovered, 4 cases. This article is well worthy of careful perusal.

Cases where both kidneys have been subjected to operative procedures, with recovery, have also been described. Whipple, of Plymouth, England, $\frac{6}{\text{Mar.12}}$ records a case where, by reason of congenital stricture of both ureters, both kidneys were subsequently affected. The left one was first involved, it undergoing dilatation and then atrophy of its secreting tissue. It persisted simply as a sac. The right kidney underwent, in the meantime, a compensatory hypertrophy, together with considerable dilatation. There being much pain in the right kidney, in 1890, nephrotomy was performed and the organ drained through the loin. It was then discovered that the right kidney was doing most of the work. Several months later, suppuration occurred in connection with the left kidney, necessitating the removal of that organ. The urine from the right kidney still drains out largely through the fistula in the loin. Willy Meyer, of New York, [2065] reports a very interesting case where, some time after nephrectomy, total suppression occurring, nephrotomy in connection with the remaining kidney was performed. A thick, purulent mass, evidently caused by the rupture of a kidney abscess, was discovered blocking the ureter. This was removed and the patient recovered.

Injuries and Wounds of the Kidney.—A. Barth, of Mar-

burg, 69 Aug. 11 read, at the Twenty-first German Surgical Congress, an interesting paper on the histological changes in the healing of kidney wounds, with a consideration of the question of the restoration of kidney tissue. Aug. Schachner, of Louisville, 96 Feb., Mar. reports a large number of experiments (53 in all) on dogs' kidneys. In numerous instances the kidney was exposed and then pierced by a pistol-shot, or in other ways lacerated and contused. In others the pelvis of the kidney was opened, as in the operation of nephrolithotomy. Nephrorraphy was also practiced. After these wounds had been made, appropriate surgical measures were adopted and the results noted.

Nephrectomy.—Barth, of Marburg, 69 June 8 records a case of malignant disease of the kidney in a child of 5 years. The operation was successful. The child, however, died, four months later, of a recurrence of the disease in other organs. The author has collected a table, which is appended to the article, of 100 cases of nephrectomy for malignant disease. Of these cases, 42 died from the operation, 20 died of metastasis or intercurrent troubles, and 38 were reported cured. Among the cases reported as cured was 1 of Keyes's. 5 90 [The editors wish to announce that this case died during this year—that is, over three years after the operation—of cancerous intestinal obstruction. During the three years after the operation the patient was in quite active business, and in the enjoyment of reasonably good health. This case was certainly a great success, as the patient, previous to the operation, was in a low and critical condition, from repeated and severe nephritic hæmorrhages. In the case of children, however, owing to the great rapidity of malignant processes at that time of life, the recurrence of the disease elsewhere, as illustrated by Barth's case, makes it a debatable question whether sufficient respite from a relapse of the disease is obtained to warrant nephrectomy.] T. Jones, of Manchester, 90 Mar. reports two cases of nephrectomy, with recovery, where deep hæmorrhage from the renal pedicle was successfully controlled by the Spencer Wells forceps. In one case the forceps were removed at the end of two days; in the other at the end of five days. It is claimed for this method that it is much quicker and easier than the ligature, and that the traction on the pedicle, which is necessary in drawing the parts into view, in order to apply a ligature, is thereby avoided.

Whipple, of Plymouth, [6 Feb.27] and Peter Davidson, of Liverpool, [187 Jan.] report cases where nephrectomies were performed in suppurative conditions of the kidney associated with extensive perinephritic abscesses which communicated with the bowel. In both instances, at the time of the operation, temporary fæcal fistulæ were formed. In each case, however, the opening into the bowel closed of its own accord soon after the operation. These cases call to mind a similar condition existing in a case occurring in Keyes's practice some time since. In this case, however, the fæcal communication was so free that bubbles of intestinal gas, together with bits of fæcal material, were passed constantly *per urethram*. Nephrolithotomy was performed, after which the fæcal opening closed spontaneously. From the cases quoted one is led to infer that the natural tendency is for these openings into the bowel to close as soon as a free external vent for the kidney drainage is established.

Floating Kidney.—Riedel [4 Nov.28] publishes his ideas regarding the operative treatment of this condition. He states that most of these operations are failures, because the kidney is not fixed in the proper position. He considers that the kidney should be fastened to the diaphragm. To accomplish this the median convex border of the kidney is sutured to the upper anterior surface of the quadratus lumborum muscle. Above this suture a layer of iodoform gauze is packed in between the upper portion of the kidney and the diaphragm. The wound is also packed with the same material. This gauze is allowed to remain in place four weeks before it is removed, in order that sufficient irritation may have been produced to allow of firm adhesions. This procedure has been adopted in five cases. [The author's method of placing the kidney certainly seems good, although allowing four weeks to elapse before removing the gauze would appear to be a needlessly long period.]

Hydronephrosis.—Albarran and Legueu, of Paris, [3 Apr.30] reported, at the Sixth French Surgical Congress, the results of their investigations and experiments in reference to hydronephrosis. If hydronephrosis is complete,—that is, if the urethral outlet is wholly impervious,—the authors assert that only a moderate dilatation of the kidney occurs, since atrophy of the nephritic tissue, under such circumstances, speedily ensues, thus putting an end to the secreting process. If, however, the hydronephrosis is incomplete,

great dilatation eventually takes place, since in the latter condition hypertrophy rather than atrophy of the parenchyma is the rule.

Intermittent Hydronephrosis.—Terrier and Baudouin, of Paris, [91 Sept.,Oct.,Dec.,'91] in a series of articles, consider this subject in a very thorough manner. Eighty-three cases illustrating intermittent hydronephrosis are recorded. The usual cause for this condition is a floating kidney which, when displaced, causes a kink in the ureter, thus arresting the evacuation of urine until the organ slips back into place again. The authors assert that most of these cases of intermittent hydronephrosis eventually become permanent, owing to inflammatory changes which often result in bands of adhesions, thus fastening the kidney in its displaced position. These intermittent attacks cause much pain and distress until relieved. Early operation is advised in order to fix the kidney in place before it becomes disorganized and inflamed, otherwise removal of the organ may be necessary.

Faguet, of Bordeaux, [188 Dec.27,'91] reports a case of hydatid cysts of the kidney, where a lumbar incision was made with the expectation of finding simply a floating kidney. The operator was able to enucleate the cysts. The wounds in the kidney were then brought together by sutures.

James Israel, of Berlin, [69 Jan.7] appears in an interesting article on the relations of syphilis to surgery of the kidney.

SYPHILIS.

By J. WILLIAM WHITE, M.D.,
ASSISTED BY
WM. HENRY FURNESS, 3d, M.D.,
PHILADELPHIA.

HISTORICAL.

Joannu, of Athens, before the Second International Dermatological Congress, in Vienna, $\frac{8}{\text{Sept. 29}}$ quoted from Herodotus, Hippocrates, Celsus, Galen, Dioscorides, and many others,—even from the Fathers of the Church,—to show that venereal diseases were almost as common in the days of these writers as now. Allusions are frequently made, and descriptions given, of ulcers on the genitals, both male and female, and in the nose, mouth, lips, and pharynx. One writer speaks of the dwellers in the town of Tarsus as being so dissolute that they were covered with disease, their voices were changed by the inflammation in their throats, and that Venus, in her divine wrath, had taken away the noses of many. Joannu states that, up to the year 1821, venereal diseases were rare in Greece, and that even now they are not common. This he attributes to the strict morals and abstemious life of the people; also, to the custom of youthful marriages. When the disease does occur, it is usually of a very mild character. Spyrokolon (literally, pustules on the nates) is, it appears, however, a form of syphilis which, in the past quarter of this century, has been more or less prevalent throughout Greece, and in some places almost endemic. It begins usually on the nates or scrotum, also on the genitals, as an exanthem or an eruption of pustules, which spreads to various parts of the body; no ordinary primary lesion can be discovered. Mercury is most successfully used to combat it.

GENERAL.

A. H. Ward, $\frac{6}{\text{Sept. 10}}$ in explaining several obscure conditions connected with syphilis, states that it is generally admitted that

syphilis must be caused by the growth of a specific micro-organism in the fluids of its victim. This organism is probably a bacillus, and kindred to those of the other diseases characterized by the formation of infective granulomata. Ward's hypothesis is as follows: 1. That the bacilli of syphilis produce, as a condition of their existence, a toxin, this toxin being probably an albumose of like nature to those isolated from cultures of tubercle and anthrax bacilli. 2. That when this toxin is present in the human body in small, slowly-increasing quantities, toleration is established and immunity acquired. 3. That it is the active cause of the phenomena of syphilis. He thinks that this theory explains the fact that syphilitic children are generally born apparently healthy. In those cases where the child is not born healthy, or dies *in utero*, it explains the occurrence of placentitis gummosa and placental degenerations and hæmorrhages.

According to Morel-Lavallée, $\frac{100}{\text{Mar.17}}$ the severity of an attack of syphilis may depend upon the virulence of the original infecting syphilitic germ, whereby the disease may be rendered more rapid in its course, more inclined to produce ulcerations, or cachexia; but whether this original germ can go still farther, and predetermine just what organ, or just what system, shall be invaded, is a question still open to proof. Fournier is of the opinion that alcoholism, old age, malaria, scrofulo-tuberculous tendency, and want of initial treatment are all of them important predisposing causes of severe forms of syphilis. If it be assumed that overwork of the brain predisposes to cerebral forms of syphilis, that alcohol augments the specific denutrition and directs the attack to the brain, to the liver, etc., and that malaria predisposes the vascular system to attack,—none of these factors of gravity will, after all, explain why, in the absence of any anterior affection, one form of syphilis attacks, without exception, the osseous tissue; another singles out the kidneys; and still another, with or without affecting the skin, attacks the cerebro-spinal system.

[It would be more in accord with modern views to say that the severity of an attack of syphilis depends upon the *dose* of the infecting germs, on the one hand, and upon the general vitality, *i.e.*, cell activity of the patient, on the other. The conditions mentioned by Fournier are prominent as predisposing causes of severe forms of syphilis, because they are the most frequent of all the

agencies which interfere with the organic processes on which health depends. So, too, it is probable, even when it cannot be demonstrated clinically, that the selection of the organ or system which suffers most in grave attacks is "predetermined" by local conditions producing a *locus minoris resistentiæ*. We know this to be the case in the distribution of periosteal nodes, which are found by preference on those subcutaneous bones most exposed to frequent, though trifling, traumatism. The law is probably a general one, and there is no need to invoke the metaphysical idea of the germs determining in advance the organ or system they will attack.—J. W. W.]

Goldsmith[2087 '85] reported several cases in which general paralysis followed syphilis, communicated by one subject to several others. In one case, a "respectable" gentleman contracted syphilis and gave it to his wife; about ten years afterward, both were attacked with general paralysis. In another case, a husband gave it to his wife; and from them a 16-year-old sister of his wife, living with them, also contracted it. The husband became paralyzed six years after infection, the wife in eight years, and the sister in seven years.

Morel-Lavallée also quotes a case from his own observation, in which five men contracted syphilis from the same source, and all died, at varying periods after infection, from syphilis of the brain and meninges, while, strangely enough, this same "source," enjoying good health, married and gave birth to a robust child, now 2 years old. Besides these examples, which seem to show the existence of a "vérole nerveuse" which can be transmitted from one subject to several others and produce general paralysis, there is another fact, proving beyond a doubt that this "vérole nerveuse," or syphilis of nervous virulence, has a predilection for producing diffuse peri-encephalitis, in preference to other cerebropathies, in individuals of hereditary nervous temperament; this fact is, that syphilis is found with infinitely more frequency in the antecedents of the generally paralyzed insane than in the antecedents of the insane not so affected. Mendez found a history of syphilis in 757 of those generally paralyzed.

The well-known fact that, after apparent obliteration of syphilitic papules, the papules re-appear, incited Unna[4 June 20; 3 Sept. 14] to study the anomaly. By means of a glass compressor, he was enabled, in

the case of an obliterated papule, still to detect, against the white background of the exsanguined skin, syphilitic infiltrations appearing like yellowish, slightly-transparent foci. Before the administration of mercury this papule appears like a nodule of large plasmic cells, lenticular in form, and of giant-cells in the upper half of the skin, in close connection with the vascular tissue, and, in this situation, grows by a proliferation of the interstitial tissue formed by its fusiform cells and of its fibres; which accounts for the hard consistency of the syphilitic papule. The resorption of this papule under mercury may be divided into three stages: 1. Healing advances rapidly; the papule flattens, shrivels, becomes a brownish-yellow, but, so far from softening, becomes harder. At the end of about eight days, the second stage sets in, lasting from two to six weeks, during which the papules diminish in size more slowly, but become completely flattened, lose their hard consistency, and are no longer perceptible to the touch. Their color is gray-greenish, next gray-bluish, and finally imperceptible. The third stage is apparent healing; the syphilides are invisible, except under the glass compressor. A histological examination shows that the rapid diminution of the first stage is at the expense of the interstitial tissue exclusively, not of the plasmic cells, which are not affected by the mercury; the capillary hyperæmia ceases, the dilated lymphatics contract, the numerous fusiform cells almost wholly disappear, but the plasmic cells remain as at first. It is only in the second stage that the latter begin to show, under mercury, a gentle process of degeneration; but they never wholly disappear, endowed as they seem to be with an extraordinary vitality, which is apparently capable of indefinite prolongation. And it is this persistence which explains, according to Unna, on the one hand, the recurrence of secondary symptoms, so frequently appearing in the same locality; and, on the other, the immunity from a second infection. In view of Buchner's theory, it may be questioned whether or not the remnants of the plasmic cells of syphilides might not secrete persistent alexines, which would render old syphilitic patients refractory to re-infection.

These observations and conclusions of Unna obviate the necessity for either a new classification or a new nomenclature, both of which Leloir adopts,[2088] followed by Morel-Lavallée[290 Mar 1] and Fournier.[2089] Considerable diagnostic importance is attached by

Mračeк [55 Aug.6,'91] to the decolorations (leucodermata) of the skin at the site of a previous syphilitic exanthem. The decoloration may be observed first at the edge of the roseola-spots or of the papules. These leucodermata are not manifestations, but merely the remains of manifestations, and medication has no effect upon them. They are most easily observed in negroes or dark-skinned people, in situations naturally pigmented, viz., the nape of the neck and chest in working people, where these regions are commonly pigmented from sunburn.

Hygiene.—Too much emphasis cannot be given to the admirable suggestions on the prevention of the spread of syphilis, read by C. W. Allen before the Academy of Medicine, New York, May 18, 1892. [1 Sept.17] All foolish sentimentality, he urges, should be cast aside, both by the laity and by the profession, and syphilis (which, if the name grates upon the ear, may be called *lues*) be regarded in its true light, as a wide-spread, devastating, contagious disease. This same sentimentality does not keep us, in our magazines, in the public press, and in the drawing-room, from making frequent allusions to leprosy, which is scarcely less a venereal disease than syphilis. Popular instruction in all kinds of preventive medicine cannot be amiss; let the physician merely show the proper way to treat the question, and the public will quickly follow. Then a time may come when, instead of the advertisement of the quack (the only reference to syphilis now found in our public journals), wholesome instruction may be occasionally given to the infected how to avoid infecting others, and hints to the healthy how to avoid infection. He pleads, also, for more thorough instruction in this branch to medical students. The amount of time and attention given to it in many medical schools is simply farcical.

It should be made a crime, under a heavy penalty, for any keeper of a house of ill-fame to maintain for public purposes a person known to have a contagious venereal disease; it should also be a crime for a person having a venereal disease knowingly to transmit the same by cohabitation. Closing the brothels only changes the character of prostitution; public prostitution is driven to private prostitution, which has been proved to favor the chance of an increase of syphilis. There can be no doubt that strict legal regulation is one of the most potent means of keeping down this

disease. Blaschko [41 Jan. 11] has published a study of venereal diseases in Berlin during the past twenty years, and his statistics show that venereal diseases, particularly syphilis, have steadily diminished. This he regards as due not so much to the strict oversight and regulation of prostitution, as to the greater facilities now offered for proper treatment, to a greater diffusion of knowledge relating to the dangers of syphilis, and the necessity for prompt and thorough treatment.

Allen concludes by saying that syphilitics should be freely admitted to the hospitals, and an act should be passed in all States (it exists at present only in Massachusetts) permitting the detention of all patients, be it in hospital, prison, or house of correction, who, according to the opinion of the attending physician, are in a contagious stage of syphilis.

[Some years ago I expressed my general views on this subject as follows, and I have seen no reason since to change my mind: 1. That in syphilis we are dealing with a bacterial disease of such demonstrable antiquity that it is evident that it has no tendency to become extinct; but, on the other hand, likely to continue indefinitely. 2. That this disease already affects a large number of the population, and that by means of its many forms of inoculation and transmission it is rapidly spreading still farther. 3. That the existing means for its treatment among the poorer classes are insufficient, and that the establishment of institutions for that purpose, or the endowment of special wards in our general hospitals, is a measure eminently worthy of the attention of the public-spirited and benevolent. 4. That its most common mode of propagation is by irregular or illicit sexual intercourse; and that, therefore, we should turn our main efforts at prevention in this direction, while endeavoring, at the same time and in every decent and proper manner, to guard the community at large from the effects of ignorance. 5. That prostitution, arising in response to the demand for this illicit indulgence, has, like syphilis, existed from time immemorial, and is not likely to disappear. 6. That prostitutes themselves need protection and have claims on the humanity of the law. 7. That by means of supervisory legislation and control of prostitution the unlawful sexual commerce of the world may most readily be restricted and the spread of this disease prevented. 8. That there is sufficient evidence to prove that such

control and restriction, though surrounded with difficulties, are yet possible, and that the advantages to be derived from them are definite and highly important.—J. W. W.]

Kobyline, of St. Petersburg, [703 v.7,p.127; 673 v.8,pp.12,118; Apr.] has published an essay on the use of anthropometry in the study of syphilis, which may be taken as a contribution to the series of researches made in the Kalinkin Hospital, at St. Petersburg. In this hospital a large number of prostitutes are treated who voluntarily apply for admission, besides all those who are under official surveillance. All the observations made in this enormous number of cases are registered according to a system to be made use of later on for scientific purposes. In his work, the author has closely examined the relations existing in five thousand patients as to height, weight, and temperature of the body on the one hand, and the course of syphilis on the other, and he has come to the following conclusions: The liability to syphilitic infection is not the same in women of different heights; the most favorable mechanical conditions for infection are offered by small women, yet these have far greater immunity from attack. In patients from 16 to 20 years of age the mechanical conditions prevail, and after that age the immunity. Gummata impede growth; a syphilitic attack decreases weight. In the condylomatous stage general treatment more than counterbalances the loss of weight. The greatest loss of weight under the influence of syphilis and the greatest increase of weight through general treatment are found in the case of gummata. The essential syphilitic fever of Fournier is found in those relatively rare cases in which no perfect parallelism exists between the external syphilitic manifestations and the change of temperature. Syphilis runs the most favorable course in women of medium height and weight, and the least favorable to women who are tall and stout, but proportionately light in weight.

Buret [479 pp.621,646,'91] discusses the causes of error in the diagnosis of syphilis. The induration of the sore may be so slight as to escape detection, or it may appear only after the lesion has existed for some time as an herpetiform ulceration. Thus, chancre of the lip is apt to be diagnosed as cancer, unless the symptoms are typical and the history conclusive. Several cases came under his notice in which the induration did not appear until two or three weeks after the first appearance of the sore. In these cases the

diagnosis of herpes is almost always made. Syphilitic chancres with tardy induration may also be diagnosed as chancroids. Two cases, quoted from the experience of Galligo, illustrate this point.

Finally, errors in diagnosis may arise in cases of masked chancres situated on the cervix uteri, or in the prostatic urethra, and only seen by means of the speculum or urethroscope. In the secondary stage the statements of the patients as to their previous symptoms are—frequently from willfulness, often from ignorance and lack of observation on their part—misleading, and cause errors of diagnosis, only to be rectified by disregarding all statements, acting purely on ocular evidence, and applying a therapeutic test. On the other hand, many cases of herpes genitalis are erroneously diagnosed and treated as syphilis. Likewise, the author cites cases where confluent ulcerated vegetations and ulcerative stomatitis were diagnosed as syphilis.

Among the lesions of the third stage, ulcerating gummata are often very deceptive, and frequently mistaken for primary lesions, or even for chancroids. Gumma of the tonsils may resemble a cancer so closely as to deceive the most skillful. Blondin and Velpeau both operated upon gummata of the tonsils, mistaking them for cancer. Buret met with a case which so closely resembled anthrax that he diagnosed it as such, until the character of the submaxillary tumor put him on the right track, when he effected a cure with iodide of potassium.

Tchaguine [824 p.142] reports a case of small, benign papilloma of the labia majora diagnosed and treated as a syphilitic lesion. Gaucher [3 Apr.30] mentions the case of a woman, transferred from the surgeons to the physicians, with the diagnosis: "Double white swelling and phthisis pulmonalis; inoperable." He found above her elbow a single suspicious papule, which decided him to give specific treatment. This completely cured both the "white swellings" and the pulmonary lesions.

Citron [41 June 30] criticises Marshalkó's assertion [868 Aug.20,'91] that the microorganisms of syphilis are characterized by slowness to take stains and by rapidity of decolorization. Citron asserts that similar bacilli, with similar action under staining agents, are to be found in the secretion of hard abscesses and in normal smegma, and that Marshalkó has employed a method of staining which merely facilitates observation.

HEREDITARY SYPHILIS.

Romiceano, of Bucharest, [73 p.209] gives the results of his observations, during seventeen years, of seven hundred and twenty-three cases of *infantile syphilis*, which was found to appear chiefly between the first and fifth months, and only twenty-seven times in all after the sixth month; with but few exceptions, hereditary syphilis appeared first as coryza. Mucous patches were most common, of the vegetative form, seldom ulcerous. Syphilitic rhagades were tolerably frequent around the mouth and nostrils. Pemphigus was quite frequent, and also cachectic abscesses; syphilitic eczema, gummata, and bone diseases were seldom observed.

Diday [132 Mar.; 236 Nov.] analyzes Colles's law, and notes how, in a certain number of cases, the mother who bears a child begotten by a syphilitic father contracts during the second or third month of pregnancy a disease which is syphilis without the primary symptoms. As a rule it is, fortunately, otherwise, and the mother may carry the child to term and may suckle it and fondle it without contracting the disease, though it may be suffering from acute symptoms, including ulceration of the mouth. Diday explains this well-known phenomenon by Pasteur's discovery that methodical repetition of inoculation attenuates and ultimately neutralizes the virus. This is shown when animals are repeatedly inoculated with the virus of hydrophobia. When a woman bears a syphilitic child, the blood, freely circulating between mother and fœtus, becomes a perfect vehicle for repeated inoculation,—an "attenuating fluid," or *porte attenuateur*. Indeed, the inoculation is constant; as Diday expresses it, the mother is rendered proof against syphilis by seven or eight months of perfected Pasteurization.

Molfese [513 Jan.20; 1 Apr.23] cites the case of a young man, 23 years of age, who contracted syphilis and was treated with protiodide of mercury and calomel. Intense headache, evening fever, and profuse night-sweats ensued after a short period. Inguinal, cervical, and submaxillary adenitis was present. There were mucous patches on the sides of the tongue, on the pillars of the fauces, on the soft palate, and at the angles of the mouth, and a maculopapular syphilide covered the body. The bichloride of mercury was then injected, and marked improvement was noted after the tenth injection. Disappearance of the headache, fever, and erup-

tion marked the improvement, but the mucous patches persisted, breaking out anew in another place when they disappeared from a previous one. During two years of observation it was found that, if for any period, however short, there was an interruption of the injections, the submaxillary and inguinal glands became swollen and painful. Not fully two years after the date of infection the patient married a healthy woman, who, ten months later, gave birth to a healthy child. The patient had, immediately preceding marriage, subjected himself to a treatment of 80 injections. Neither mother nor child showed any evidence of syphilis. The woman, becoming pregnant for the second time, aborted at five months, and two months later again conceived and aborted at three months. After the first abortion glandular enlargement was found; she lost flesh, and had rheumatoid pains. Two months after the second abortion she again conceived, and was delivered at term of a healthy child. The woman underwent no treatment, with the exception of taking a few ounces of iodide of potassium. The husband received 15 hypodermatic injections, but this was when the pregnancy had already advanced to six months. Molfese concludes, therefore, that the mother was infected not from the husband, but from the first fœtus; and that a syphilitic father who has had borne to him one healthy child cannot count upon his immunity from the disease for his other offspring. [This conclusion is, however, manifestly arrived at upon insufficient evidence. The case could be reported as evidence of the influence of treatment, or its absence, upon the transmissibility of paternal syphilis.—J. W. W.]

Ferras [41 No.52] saw a number of cases where, after the birth of one or two healthy children, a third and fourth child had been born syphilitic. Ferras followed up to its tenth year a child born of syphilitic parents; its health and development were normal up to its fifth year; then development was checked. At the age of 10 the child showed the capacity and strength of a child of 6 years. Intelligence was tolerably acute. He further observed a young girl whose first symptom of lues appeared as a gummatous outbreak on the lower extremities. Hence, he concludes that syphilitic parents, even after having given birth to healthy children, must be subjected to appropriate treatment.

Etienne [48 V.11] has entered into an exhaustive research as to the

influence exerted upon the health of the offspring by the treatment of the syphilitic mother. His results are closely in accord with those of Fournier. He finds that the mortality of infants born of syphilitic mothers who have not been subjected to mercurial treatment is enormous,—over 76 per cent. at birth, and over 95 per cent. when the few children born alive are kept under observation. When the mothers have been subject to antisyphilitic treatment, this mortality is only 11 to 16 per cent. If the treatment is pushed during the course of pregnancy, statistics fully authorize the hope that very few, if any, of the children will perish. Of ten cases observed by the author, not a single infant died. Eighty per cent. of the infants were born at term. Syphilis exerts its most pernicious influence upon the offspring during the fifth, sixth, and seventh months of intra-uterine life.

From personal observation, Etienne concludes that paternal syphilis is distinctly less pernicious in its effect upon the offspring than is that derived from the mother. When the mother becomes infected during the first three months of pregnancy, and is not treated, the results, as regards the offspring, are more disastrous than when the disease is acquired later. In these cases a mortality of 100 per cent. is reached. When infection occurs during the fourth and fifth months, the results are somewhat more favorable. When the mother becomes infected during the eighth month, an apparently healthy infant may be born, although in one case reported by the author, in which infection apparently took place in the eighth month, the infant was seemingly healthy at birth, but later developed syphilitic lesions. In cases of syphilis acquired during pregnancy prompt treatment was most efficacious. In no instance were any unfavorable results noted as the result of treatment.

In contrast with these conclusions, it is interesting to note that Kassowitz states that, of 35 syphilitic women who were treated by inunctions, the delivery was normal in all. Of 23 treated by inunctions and iodide of potassium, 37 per cent. were delivered before term. Of 19 treated by iodide of potassium and bichloride of mercury internally, 15 per cent. gave birth before term. Of 17 treated by iodide of potassium alone, 40 per cent. were delivered before term.

Syphilis occulta is defined by Fleiner [41 June 30] as that form of

tertiary lues where there is absolute unconsciousness of a primary infection or of secondary manifestations. This occult syphilis differs from the latent in that in the latter manifest constitutional syphilitic symptoms have preceded. Fleiner classifies the cases into three groups, viz.: 1. Wives of all husbands constitutionally syphilitic prior to marriage, or infected subsequently. 2. Women who have aborted several times, or who have born syphilitic children. 3. Cases of syphilis hereditaria tarda. In the first group, we may assume that the infection followed, in the usual way, from coitus. The possibility that the infection of the wife can follow from syphilitic semen is not yet clearly proved; but that the spermatozoa may be transmitters of syphilitic poison is established by the fact that the semen of infected men produces infected children. The children of these occultly syphilitic women, cited by Fleiner, remained, without exception, healthy. Loeb [41 June 30] thinks that absence of trace of primary lesion by no means proves that there has been none, since scars remain only after deep ulcerations. Furthermore, an obscurely-situated primary sore could run its course without any subjective or objective symptoms.

It is an undoubted fact that mothers of syphilitic children can remain free from syphilis, but there have been cases of mothers being inoculated from their luetic children. Again, there have been women who, while married to syphilitic men, have borne syphilitic children, themselves remaining healthy; and in a second marriage have borne healthy children to healthy husbands. Colles's law of the immunity of a mother in nursing her syphilitic child is well known. Hutchinson maintains that a latently syphilitic man infects his wife only when he impregnates her, and then she acquires syphilis in its tertiary form. Fleiner argues that undoubtedly a proportion of the women to whom Colles's law applies cannot be regarded as healthy, since they must undergo antisyphilitic treatment in order to bear healthy children, and subsequently may bear syphilitic children to a healthy father. It is not unusual for such women to develop syphilis at their menopause. [I am not familiar with the evidence, if there be any, upon which this assertion is based.—J. W. W.]

According to Fleiner, a child may pass through a complete secondary stage of syphilis while in the uterus, so that at the time

of birth the child is temporarily healed, and is in a latent stage of syphilis. This coincides with Profeta's law concerning the immunity of children of syphilitic parents. This occult form must not be confounded with syphilis contracted in early childhood and remaining latent fifteen to twenty years.

Besnier [3 Apr.30] cites a case of deep and extreme ulceration of the lip and nostril, much resembling a syphilitic lesion, but in which there was no history or indication of that disease (except an abortion some years before). Its brief previous existence (only a few weeks) excluded lupus. Mercurial treatment effected a rapid and almost complete cure. This Besnier regards as a case of syphilis hereditaria tarda.

Neisser, of Breslau, at the Dermatological Congress in Vienna, proposed that the name "syphilis hereditaria tarda" be abandoned, because down to date not a single admitted case of that disease was to be found. Neumann [283 p.417] also acknowledged that he had never observed an indubitable case. His view of the origin of the products of tertiary syphilis was obtained from microscopic investigations, which had taught him that, when a sclerosis developed, for instance, on the lips, exudation was still to be found in the vessels months, and even years, afterward.

A very interesting study of the blood in hereditary syphilis has been made by Loos, [8 May 19] whereby he is enabled to conclude that: 1. Hereditary syphilis is always accompanied by an anæmia, which, under certain circumstances, may attain a colossal intensity. 2. This anæmia is characterized by decrease of the red corpuscles; by a marked change in the red corpuscles; the presence of megalocytes and microcytes; by the presence of nucleated erythrocytes, at times in an extraordinary quantity; by an ever-present leucocytosis, which may reach a very high percentage, and by the presence of myeloplaxes in the blood. This anæmia presents a highly important symptom of this disease, and may possibly be the immediate cause of death.

Eisenschitz [366 Aug.1] refers to the results of E. Schiff's observations [622 No.3] on the pronounced anæmia (oligocythæmia or oligochromæmia) which follows the disappearance, after antisyphilitic treatment, of luetic symptoms in children. The hæmoglobin element, as long as the oligocythæmia is trifling, is greater than at a subsequent period, when the reduction of the red corpuscles is at its height.

The reduction of the hæmoglobin is not, after all, proportional to the number of the red corpuscles, but is contemporaneously less, the paler the latter are (oligochromæmia). The reduction of the hæmoglobin does not depend upon mercurial treatment (Lazing). Schiff found no decided abnormality in the white corpuscles. In the examination of seven rachitic children, Schiff found the number of red corpuscles subnormal, the number of white somewhat increased, and the hæmoglobin lessened,—seldom higher than 65 per cent. It is probable that the phosphorus treatment improves the accession of the hæmoglobin and probably the oxidation of the blood, and consequently the nutrition of the brain.

As concerns the white corpuscles, Loos $^{8}_{\text{May 19}}$ observed a leucocytosis in all cases of hereditary lues, in direct ratio with the severity of the disease. In mild, improving cases, the proportion between the white and the red was 1 to 573; in fatal cases, 1 to 35. Bieganski also observed this increase, and called it genuine syphilitic leukæmia. Einhorn found, in health, the quantity of lymphocytes (large and small) to be, on the average, 28.5 per cent. of the leucocytes; further, that in acute anæmia with leucocytosis, the percentage of lymphocytes was as low as a fourth or fifth of the normal, though the absolute number of lymphocytes remained the same.

Moncorvo, of Rio de Janeiro, $^{363}_{\text{Jan. 23}}$; $^{112}_{\text{Apr.}}$ details three cases of "Parrot's disease," or syphilitic pseudoparalysis. The first was a boy of 2½ months, with a syphilitic father. The child was very poorly nourished, with skin eruption, diarrhœa, and complete paralysis of both arms and one leg. He was treated for a time with bismuth salicylate and quinine, by which the diarrhœa was controlled. Inunctions of mercury were then employed, to which the child responded promptly. The eruption soon disappeared, and he gradually regained the use of the paralyzed limbs. The second case was a boy of 3 months, with distinct history of syphilis in the parents. He had severe coryza, a papular eruption, and lienteric diarrhœa, alternating with constipation. He was emaciated, with dry skin, hairless, and with a constant, irregular fever. The right arm was completely paralyzed. He also responded immediately to antisyphilitic treatment. The third case was also a boy, 3½ months old, whose mother was syphilitic. He was emaciated, with severe coryza, and his left arm was paralyzed.

The same treatment produced immediate results. In all of these cases the epiphyses of the long bones were swollen and tender. The muscles were not degenerated, and responded normally to electric stimulus. The writer sums up the characteristics of the disease as follows:—

1. Not all the limbs are affected. The paralysis is mostly symmetrical. Both arms are generally affected, and occasionally both arms and one leg, or *vice versâ*. Hemiplegia has only been noted once. 2. The disease occurs only in infants. 3. The paralysis promptly becomes complete in the affected members. 4. The epiphyses are swollen, very painful, and crepitant. 5. The muscles are not atrophied. 6. A little power of movement is left in the toes and fingers. [These cases are obviously examples of syphilitic osteo-chondritis, which was found by Pollnav in thirty-five out of fifty syphilitic fœtuses.—J. W. W.]

Heller $^{69}_{\text{June 30}}$; $^{2}_{\text{Aug. 20}}$ gives short details of fourteen published cases in which hydrocephalus and congenital syphilis co-existed, and refers to two additional ones. He reports the following case: Seven weeks after birth the infant had an eruption on the palms of the hands, on the soles of the feet, and on the legs, quite typical of congenital syphilis. After treatment with sublimate baths and small doses of calomel the rash quickly disappeared. When six months old the child's head was noticed to be very large, the appearance being exactly that of hydrocephalus. The anterior fontanelle was of great size, and the intervals between the bones very distinct. The face was markedly small by contrast. The child was treated with iodide of potassium. Five months later the head did not appear to be hydrocephalic. The anterior fontanelle was much smaller, and the frontal suture could hardly be felt. There can be no doubt of the existence of congenital syphilis and hydrocephalus in this case. The enlargement of the head was not due to rickets, for there was no evidence of that condition. The result of treatment would also support the idea of the hydrocephalus being the result of syphilis. Only in one of the cases referred to above did the hydrocephalus disappear during antisyphilitic treatment. In this case, as well as in the author's, the treatment was commenced early. Heller concludes that, in all cases of hydrocephalus, congenital syphilis should be looked for, and, if found, antisyphilitic treatment should be adopted energetically and as early as possible,

Carpenter [15 Sept.] reviews the affections of the testicle, and concludes as follows: 1. The testicles may be affected so slightly in congenital syphilis that it needs the microscope to detect the malady. 2. In a certain small percentage of cases of congenital syphilis the lesions of the testicle are such that they can be detected by physical examination. These lesions may be present at birth, arise soon after, or make their appearance some months or years afterward. The general rule, however, seems to be from birth up to two or three years, not often after this time, and very rarely indeed at puberty. Fournier's case of twenty-four years seems to be the present extreme limit. Syphilitic orchitis may arise when the patient is apparently thoroughly under the influence of mercury; but in this latter respect it does not differ from other syphilitic manifestations. 3. The testicle is, more often than not, alone affected, but not infrequently the testicle and epididymis suffer together, and quite exceptionally the epididymis is attacked singly. It appears from Bumstead and Taylor that the cord may suffer, and in one of Obedenaro's cases it was as thick as a child's thumb. The vas, vesiculæ seminales, and prostate are not attacked; at least, so far there has been no record of such a complication. 4. The disease is, very frequently, but not invariably, bilateral in its distribution, though one side may be more advanced in pathological changes than the other. 5. Hydrocele of the tunica vaginalis is not such an infrequent accompaniment of the malady as some writers would have us believe, and it may be, in young infants, the earliest indication that there is something wrong with the testicles. In all probability, as time goes on, the fluid is re-absorbed, and then the condition of the gland itself becomes more marked. 6. There is just a possibility that hydrocele of the cord may, in some instances, owe its origin to congenital syphilis. 7. The swelling of the testicle is painless, feeling like scirrhus; it is usually, but not invariably, nodular, and sometimes ulcerates, forming a fungous testis. 8. The enlargement of the affected organ is usually not great; and, in fact, there may be no perceptible enlargement, it being a very rare occurrence indeed to find in infants and children a testicle the size of an egg. 9. In the large majority of instances the microscopical appearance is that of the simple inflammatory form, passing on to the development of fibrous tissue, with consequent destruction of the gland, leading possibly, if not

attacked in time by suitable remedies, to impotence and sterility. [Such testicles are usually the result of metastasis of mumps.—J. W. W.] Certain atrophied organs may be accounted for in this manner. A scrotum, of natural or almost natural dimensions, containing an atrophied organ, the vas, seminal vesicles, and prostate being free, with marks of congenital syphilis on the person, in the shape of scars, the characteristic physiognomy, specific eye troubles, or what not, would suggest such a causation. The inflammatory form is akin to that observed in the liver. Gummata, on the other hand, are rare manifestations.

Israel [41 May 19] states that the contracted kidney which is seen in adult syphilis is very rare in children hereditarily syphilitic. Lewin only once saw anasarca and albuminuria. On the other hand, striking cases have been observed by Molière, Klebs, Lancereaux, Parrot, and others.

Fränkel [69 Apr. 28] exhibited preparations from a child with congenital syphilis, where the disease had its chief seat in the lungs, in which locality the affection may be either diffusely inflammatory or gummatous nodules may be present. The preparations belonged to the former class, and were taken from a child who lived an hour and a half. The tissue was almost entirely hepatized. In separate spots there were whitish-gray foci, without sharply-defined boundaries. Histologically, there was a proliferation of alveolar epithelium. The epithelial cells were filled with kernels of fat. In addition, there were scattered flakes of pigment. That this was an actual case of lues is clear from the facts that similar affections in newly-born infants are unknown; and that there were other signs such as the osteochondritis syphilitica described by Wegner.

L. Jullien [287 No. 4, '91; 336 Jan. 23] states that, in the cases of 206 fœtuses, 36 were aborted and 8 were born dead; of 162 born at full term, 69 either died immediately after birth or in infancy; of the remainder, 50 were syphilitic and 43 apparently sound. In all these cases, either one or both of the parents were syphilitic. The statistics collected by Neumann, of Vienna, [22 Feb. 17] are as follow: The percentage of mortality in cases where infection took place before conception was 65; concurrent conception and infection, 75 per cent.; in post-conceptional infection, 39.8 per cent. In the first month of pregnancy syphilis transmitted from the mother will kill the child; later, it is not so much endangered, and in infection in

the ninth month of pregnancy the disease is not transmitted to the child. A father suffering from tertiary syphilis, if a long time has elapsed since he was first infected, can have healthy offspring, but similar conditions of the mother have a deleterious influence on the fœtus. [While tertiary syphilis of the mother may have a "deleterious influence," there is no evidence that it ever results in the transmission of the specific disease to the child.—J. W. W.]

PRIMARY LESION.

Average Incubation of the Chancre.—Mauriac $\frac{212}{\text{July } 10}$ assigns about thirty-four days to the incubation of the chancre, but admits that in certain cases it may greatly vary both ways. In a series of nineteen cases, he found the average incubation to be sixty-three days; in one case it took as long as seventy-one, and in another only nine days. Generally, when the primary incubation was short, the secondary incubation was also short. Observations on the period of incubation are of diagnostic rather than prognostic value; no relation exists between the length of incubation and the severity of the subsequent attack; but if the sore has made its appearance after an unquestionable incubation of fifteen to twenty days, then it may be diagnosed with assurance, even in the absence of all the other signs, as syphilis.

Taylor, of New York, $\frac{1}{\text{Jan. } 2}$ in an article on "Genital Chancres in Women," says that such chancres are far less regular in their course than in men. In many women the chancre is so small, benign, and ephemeral that it may never be seen, or, if seen, its nature is usually not suspected. In very many cases, even when the lesion is strikingly apparent, its nature remains for a long time in doubt, owing to inflammatory complications and to a want of striking individuality in the lesion itself. Then, again, simple inflammatory processes and chancroidal ulcers upon the female genitals often become so complicated and obscure in appearance that they may resemble specific lesions. In women, induration as a symptom is not so generally observed as it is in men. In some females it can scarcely be appreciated by careful examination, and it may be very transitory in its duration, whereas in others it attains large proportions, lasts for indefinite periods, and may lead to ultimate deformity. In men the chancre is readily examined. In women this lesion, owing to the nature and inaccessibility of

the parts, is very difficult of examination, except when found on protruding portions of the genitals. The main reason why chancres in the female are so little understood, so frequently unrecognized, and generally offer so much difficulty in diagnosis, is that there is very little chance for their study on a large scale, and faithful pictures of them are not obtainable.

Taylor says that for clinical purposes we may divide genital chancres in women into the following varieties: (1) the superficial or chancrous erosion; (2) the scaling papule or tubercle; (3) the elevated papule or tubercle (exulcerated)—ulcus elevatum; (4) the incrusted chancre; (5) the indurated nodule; (6) the diffuse exulcerated chancre.

The *Chancrous Erosion* is always found on the surface of the mucous membrane. It begins as a red spot, somewhat deeper in color than the mucous surface on which it is seated. It is very rarely, if ever, seen in women in the first few days of its existence, for the reason that its presence is usually unknown to the patient, or, if seen by her, it appears so simple, mild, and harmless that its nature is scarcely ever suspected. Thus it is that when first seen by the physicians the red spot has become, by desquamation of its epithelium, an erosion. When seated on smooth surfaces, such as are presented by the internal surfaces of the labia majora and the greater part of the labia minora, this lesion, when somewhat advanced, presents certain well-defined features, but when it is developed upon the anfractuous surfaces of the fourchette, the introitus vaginæ, the vestibule, and around the urethra, its appearance is not striking, and, indeed, is often misleading to the eye, while its exploration is difficult and unsatisfactory to the touch.

The true chancrous erosion scarcely presents an appreciable elevation, and the lesion may run its course and disappear without ever becoming salient above the normal plane. A frequent and striking peculiarity is its short period of existence. It frequently comes and goes without the knowledge of its bearer. Physicians, young and old, are often much surprised that on female patients presenting early secondary lesions they can find no trace of the chancre. Not only does this lesion frequently undergo rapid involution, but it may also leave no trace after the lapse of a few days.

The Scaling Papule or *Tubercle* is found upon the outer surface of the labia majora; appearing as a thin, white film,

presenting a glistening appearance. This film, which is formed of necrotic tissue-elements and serous secretion, increases in extent and thickness until a species of false membrane is formed, which is wrongly called "diphtheritic membrane." As this membrane increases, it becomes of a grayish-cream color, which in some instances is tinged with a very light green. In this state the membrane of syphilitic chancre may be said to present its typical appearance.

The Indurated Nodule.—This chancre, so common in men, is very rare in women. In men the syphilitic neoplasm or nodule, as a rule, circumscribes itself in compact form into a little mass; in women this new growth tends to diffuse itself more loosely into the soft mucous tissues. Thus it is that we rarely see the indurated nodule in the female sex, except on parts where the skin and mucous membrane fuse together. The indurated nodule is seen as a sharply-circumscribed mass of indurated tissue, which may be rather broad and flat, or which may have a rather narrow base, sloping edges, and flat surface. The color of the lesion is dull-red, and its surface may be smooth and glossy, or it may present the grayish color of the incrusted chancre, with all the variations found upon that. The course of this lesion is very chronic, and on its disappearance a pigmented spot may be left or atrophied skin may be evident.

The Diffuse, Exulcerated Chancre.—This lesion is observed in women of the lower order who are uncleanly in their habits and given to debauches. It presumably begins as the chancrous erosion, develops into the ulcus elevatum, and from this stage it further increases. It is usually seen involving more or less of one lip, large or small. The morbid area is much thickened, of a deep-red color, and it is exulcerated over the greater part of its surface. In these very large chancres we find a raw, uneven surface, and very often small or large ulcerating spots. Their course being chronic and indolent, their appearance varies. At some times they are raw, like beef, and at others they look like elephantine, incrusted chancres. They are very often complicated with the development of hard œdema.

In the treatment of chancres in women, too much attention cannot be paid to the matter of cleanliness and to the production of a dry state of the parts. In some mild cases of chancre

simple lotions only are necessary. When the lesion is well developed, it should be constantly covered with mercurial ointment.

Ohmann-Dumesnil[451 July] discusses the question of auto-inoculation of syphilis concisely and logically, and, in addition to two cases, presents a careful *résumé* of all the recent writings upon this subject. The following conclusions are arrived at: (1) the probability of auto-inoculation in early syphilis has not been proved; (2) while there may be strong presumptive evidence in favor of it, it is, at best, only a possibility; (3) the most crucial experiments prove that excision of the chancre at the earliest possible moment is futile and falls short of its purpose; (4) in multiple chancres at a distance from each other the lesions are due to the same inoculation, as a rule; (5) in multiple chancres of different ages it is probable that the younger are merely irritative scleroses; (6) experiments so far apparently prove that syphilis is constitutional at the time the initial sclerosis makes its appearance.

In regard to this last conclusion, Otis differs from the author, believing that, while the most crucial experiments prove that excision of the chancre at the earliest possible moment is futile, and that, almost immediately after the inoculation, the disease is beyond the reach of the knife or caustic, at the same time there are reasons to think that during this so-called primary stage the disease is confined to the lymphatics, and does not become general until the infectious material is poured forth through the thoracic duct into the general current of the blood, which period is marked by the appearance of the roseola. In substantiation of this, Otis states several accidental inoculations with the blood of syphilitics in the first stage, which were followed by no infection. [I do not think the question can properly be disposed of in this summary way. While I am willing to admit that the curability or prevention of syphilis by the excision of the chancre has not been proven, I think the absolute "futility" has not yet been demonstrated. There is certainly no conclusive proof that syphilis is constitutional at the time of appearance of the chancre, though it becomes so during the existence of the chancre.—J. W. W.]

If, for diagnostic purposes, the chancre is to be re-inoculated on a patient already afflicted with a suspected chancre, certain rules, says Coignet,[211 No.49,'91] must be observed. The puncture must

be small and superficial, and it must be far removed from the genitals. If, on the day following, there is no inflammatory areola whatever, then nothing will develop; but if an inflammatory zone develops, howeve slight, positive results infallibly follow. Then only, after remaining in this condition for several days, does the ulcer commence. If a true pustule appears, the inoculation is assured; and it is needless to wait until the ulceration broadens, but it is to be opened at once, touched with carbolic acid, and dressed with iodoform.

Multiple Chancres.—Besnier $\frac{212}{\text{Feb.10}}$ reports a case of multiple chancres occurring on the site of ulcerations produced by the itch. He warns against the danger of multiple infection, to which patients suffering from herpes are exposed, even though they may have been assured by their physicians of the innocent character of the herpes.

Berg $\frac{28}{\text{v.15,No.1}}$ has reported a case of persistent gonorrhœa, which was found to be due to a chancre about one inch within the meatus. The diagnosis was confirmed by the development of secondary symptoms.

EXTRA-GENITAL CHANCRES.

In an exhaustive tabulation of ninety-eight cases of extra-genital chancre, Neumann $\frac{57}{\text{Apr.10}}$ finds that the lips are by far the most common seat of these lesions, and that, although by no means so frequent as on the genital or perigenital regions, they are not nearly so infrequent as commonly supposed. So multiform are the sources of infection that Fournier maintains that a fourth part of the syphilis in women has been acquired innocently. Clerk and Ricord put the proportion between extra-genital and genital chancres as 1 to 3. Beloussow states that, out of 2765 of his cases, only 25 per cent. were acquired by coitus. The spread of syphilis, contracted extra-genitally, is found to be greatly increased in crowded districts. The source of acquisition has no further significance than to point to preventive hygienic measures; the course and treatment are the same, howsoever syphilis may be acquired. Neumann has not found, in syphilis acquired extra-genitally, a greater severity of symptoms.

A case of indurated chancre of the lower lip is reported by Bondogov $\frac{824}{\text{p.143}}$ which was contracted by sharing a cigarette with a

syphilitic companion. Rona [84 Nov.21,'91] mentions a case of macular syphiloderm, following ten days after a chancre, situated just below the left iliac crest. The infection was said to have been given by a country physician while treating a small pustule which appeared in this situation. Four cases of chancre of the lip, contracted by kissing, are reported by Epstein. [65 May] He, therefore, strongly urges physicians—not as a prophylaxis against syphilis only, but even against tonsillitis and diphtheria—to protest against the abominable custom of indiscriminate kissing.

Harrison Cripps, of London, [2 Apr.16] showed a middle-aged man with a peculiar growth between the lip and chin, consisting of aggregated papillæ about an eighth of an inch in length, and looking like a warty epithelioma. The surface was dry and not excoriated. The patient traced the sore to a cut inflicted at a barber's while being shaved some time previously. It was at first poulticed frequently, but ultimately enlargement of the neighboring glands, with sore throat and cutaneous eruption, revealed the nature of the case. Cripps pointed out the extraordinary appearance of the primary lesion. The president of the society said he had never seen a chancre like this very interesting example, but he quite agreed that such it was. He pointed out that papillomatous formations were excessively rare as a primary lesion in syphilis, though they were found in association with the secondary phenomena, especially at the back of the tongue. This papillomatous formation of a primary chancre was very interesting in connection with certain investigations that he had made in respect to "yaws," a disease which is very common in the West Indies. In this disease there is also a primary sore, a period of incubation, and cutaneous eruptions characterized by tendency to papillomatous growths. Personally he was disposed to regard "yaws" as syphilis occurring in the negro, differing from syphilis in the white man by this special tendency to the formation of papillomata.

Paget, of London, [6 Apr.16] reviews very freely the history of chancre of the lip, gives statistics as to its frequency (which varies greatly in different countries), and discusses the following points: As regards the condition of the lip at the moment of inoculation, there is no reason to doubt that in most cases there is nothing amiss with it. But sometimes the poison takes advantage of an old crack or fissure, such as is very common in winter, on either lip, espe-

cially the lower. Cooper gives a case where a crack of ten years' duration became the seat of a chancre. Similar cases are recorded by other English surgeons, and Pospelow says that out of forty-nine chancres of the lip a large number had begun in a simple fissure. In infants a chancre of the lip is a superficial lesion, which soon disappears; it is to the peculiar enlargement of the lymphatic glands that we must look to make sure of our diagnosis. It seems certain that in infants a chancre of the lip may lack that induration which is its mark in later life.

As regards the latter stage of syphilis thus acquired in infancy, it is said by Roussel that, as a rule, it is not severe; whereas, in nurses who are infected by suckling syphilitic infants, the later stages of the disease are usually of marked severity. Pellizzari gives a list of sixty-nine nurses thus diseased. Plummert gives two cases of nurses who were attacked by tertiary syphilis within a few months of infection. It may be that the severity of the disease in nurses thus subjected to it is due to their health and strength being depressed at the time of infection. In adults chancre of the lip is most common in the years between twenty and forty. As to its frequency in England, we have the statement of Cripps, at the Medical Society in 1887, that about forty cases had attended St. Bartholomew's Hospital during the past year. In Paris, at the Hôpital St. Louis, in three recent years there were 27, 49, and 45 cases, respectively.

Chancre of the lip in adults does not come to the notice of the surgeon till it is well advanced. Like chancres elsewhere, it may manifest itself, says Sigmund, either by increased growth, as a lump, or by destruction of the tissues, as an ulcer. Ricord thinks that the natural tension of the lip interferes with the healing process. The induration usually takes some months to disappear. He believes that he has seen traces of it after nine years in one case and after thirty years in another. If a chancre, or part of a chancre, be on the inner aspect of the lip, warm, moist, and sheltered, it remains smooth or eroded, and no scab forms on it; it is less raised, or almost flat, or hollow. Pospelow notes that in cases where the sore lay in this way—more or less within the cavity of the mouth—it was just like a mucous tubercle.

The lymphatic glands, in chancre of the lip, are of supreme importance for diagnosis; they are a constant and conspicuous

sign of the disease,—a token that is never wanting and never doubtful. Their enlargement takes place within three weeks of the first appearance of the sore, and in most cases within a fortnight. Afterward, the submaxillary, the cervical, and even the axillary glands may suffer. In chancre of the lower lip the glands beneath the chin are often enlarged. The deep glands escape, or are less enlarged in chancre of the lip than they are in chancre of the tonsil. The enlarged glands may attain a great size, and may form a lump almost as large as one's fist. One or more lymphatics have been felt, in a few cases, like thick, hard cords passing from the sore toward the glands; and in such cases the enlargement of the glands themselves may be but slight. In feeble persons, or if the sore is inflamed, the glands may be painful, may become acutely inflamed, and may even go on to suppuration.

As regards the prognosis in chancre of the lip, the disease will probably run its usual course, neither more nor less. Neumann, speaking of eighty-four extra-genital chancres, fifty-four of which were on the lips, says: "The disease and its results were in no way modified by the unusual method of propagation." Sigmund says of his seventy-three cases: "There is nothing special to say as to the course and close of the disease in these cases." If Fournier's rule be true, that extensive ulceration of a chancre tends to be followed by a worse rash, this also will apply to ulcerated chancres of the lip. Thus there are reasons—some real, some only apparent—for the belief that a chancre of the lip will be followed by syphilis of at least an average severity, and probably rather above than below the average.

The diagnosis and treatment of chancre of the lip remain to be considered. Besides the use of mercury, the sore must be firmly covered, and the patient must be told, in strong language, that he is a constant source of danger to all about him. Sigmund recommends that the sore be cleansed with sublimate lotion and covered with mercurial plaster. As to the diagnosis, one of two mistakes may be made: either the chancre is taken for a simple swelling, or boil, or inflamed spot in the lip, and is neglected; or it is taken for cancer, and is excised.

Chancre of the lip is commonest in the young and middle-aged, as common on the upper as on the lower lip, and as common in women as in men. Chancre is rapid; its scab is often dark and

rupial; the lip is often red, swollen, and stiff; it is seldom destructive, painful, or fetid. The glands swell in a few days; they rapidly attain a great size, yet are still loose, movable, distinct, true amygdaloid glands. Mercury will put an end to doubt. The microscope has been used with success; in two cases, a suspicious sore was thus shown to be only the infiltrated granulation tissue of a chancre. But the surest guide of all, in a doubtful case, is the state of the glands.

Preble, of Cleveland, $\frac{222}{\text{Dec.7,'91}}$ divides the modes of transmission of the non-venereal forms of syphilis into the brephotrophic (foundling asylum), the technical, and the economic. The first division includes all those individuals who are infected from handling and nursing infants with syphilis, and chiefly with congenital syphilis. Hundreds of cases have been disseminated through communities by syphilitic foundlings, who have been adopted into poor families for raising at the instigation of governments. Italy is famous for these cases. All modes of transmission which are similar to this belong to the same category. They all revolve about the central idea of a sphilitic baby. At times, it is the syphilitic wet-nurse who first disseminates the disease among healthy babies.

The mode of transmission in the second category is known as the technical. All those who render the public intimate body-service, such as physicians, midwives, nurses, barbers, tattooers, circumcisers, cuppers, dentists, etc., etc., may both give and receive the disease in the exercise of their calling. Besides receiving the disease from some client and then propagating it to others, a still more common way is to distribute the disease from one client to another without necessarily becoming infected. This is what occurs in vaccination syphilis, at least a thousand cases of this form having been known to occur. This is also what occurs in passing the Eustachian sound, and in the various operations performed by the barber. In tattooing, and in the ritual of circumcision, the operator is usually diseased.

The third and last form of propagation is described by the term economic, used in the sense of common sharing of household goods, and of domestic and intimate relations. Here belong all forms of personal contact which are not technical, and excluding those with syphilitic infants, such as kissing, biting, etc. The risk

here is always very great. Also to this category belong the forms of transmission by domestic articles, such as glasses, spoons, tobacco-pipes, bedding, as well as certain professional instruments, as the blow-pipe, musical apparatus, etc. The risk in the use of any one article may not be great, but when a syphilitic and non-syphilitic use a variety of things in common it is proportionally greater.

The primary lesion of syphilis may be genital; perigenital, in the genito-crural folds, on the symphysis, in the inguinal regions, on the perineum, on the inner surface of the thighs, in the anal region; or extra-genital, on the skin or mucous membranes remote from the genital region.

During ten years Neumann [2090 '90; 57 No.15,p.603] has observed 88 cases of extra-genital chancre, 37 in males and 51 in females. In 18 cases—6 in males and 12 in females—the upper lip was the seat of the lesion. The infection was usually transmitted by kissing. In 1 case the transmission was by drinking from a glass previously used by a syphilitic; in another case by a bite; in 1 case the child of a syphilitic father infected its grandmother by sucking her lips, the mother, who had nursed the child, escaping. In 28 cases—9 in males and 19 in females—the lower lip was the seat of primary lesion. Among the modes of conveyance were kissing and the use in common of eating utensils. In 8 cases—6 in males and 2 in females—chancres appeared at the angle of the mouth. In 1 case the infection was ascribed to smoking a thrown-away cigar. In 2 cases chancres appeared upon the cheek,—in 1 case, in a man; in the other, in a woman. In the latter the infection was conveyed by kissing. In 5 cases—4 males and 1 female—the primary lesion appeared upon the chin. The 4 men were infected through shaving. A male presented a chancre of the posterior wall of the pharynx and of the left palatine arch. The mode of infection was not determinable. Two women presented chancres of the tonsils. One was infected by a spoon. Chancres appeared on the alæ nasi in 3 cases,—2 in males and 1 in a female. In the last the infection was conveyed by scratching the excoriated nose with the finger-nail after cleansing a vessel in which a syphilitic had bathed. Two men presented chancres of the eyelids. The fingers and hands were the seat of infection in 11 cases,—6 in men and 5 in women. Among the modes of transmission were the washing of infected linen and a bite. Four chancres were found upon the

nipples in women. In 2 instances the infection was conveyed by syphilitic infants: in 1, by a bite; in 1, by the kiss of a syphilitic man. A child presented a chancre of the umbilicus. The mother had been infected in the eighth month of pregnancy. The child had no evidences of infection at birth, but when five months old was infected by the secretion from the papules of the mother. Three women presented chancres of the anus. Rona $^{28}_{v.13,No.10}$ has observed 46 cases: 26 of lips, 8 of the tonsils, 3 on one finger, 2 of the abdomen, 1 on the forehead, 1 on the lower eyelid, another on the conjunctiva, another on the left side of the face, another in the inguinal region, and 1 of the anus (in a pederast). In 1 case multiple chancres occurred in the wounds inflicted by cupping.

A long series of instructive cases of a non-venereal syphilitic infection has been communicated at recent meetings of the St. Petersburg Russian Syphilidological and Dermatological Society. Thus, A. I. Budugoff $^{586}_{No.1;}$ $^{109}_{June}$ reported the case of a clerk, aged 23, with hard chancre of the lower lip, the infection having been contracted through a promiscuous smoking of cigarettes with two syphilitic mates. The foolish patient had been aware of their having the disease. I. P. Reshetnikoff $^{586}_{No.5}$ showed a man with primary sclerosis on the back of the neck. The lesion developed at the site of (and three weeks after) wet-cupping, which had been resorted to by the patient on account of headache, and was performed by a Finnish woman with whitish crusts on her lips. M. S. Usass $^{586}_{No.10}$ showed a married woman, aged 41, with hard chancres of the right tonsil and posterior pillar. The patient's husband had had syphilis two years previously. A. I. Budugoff $^{586}_{No.10}$ presented a recruit, aged 24, with primary syphilitic erosion of the right tonsil and adjacent surface of the posterior pillar. When departing to the ranks from his native village, the young man, in accordance with the Russian custom, had "kissed every one and all of them," including all syphilitic inhabitants. Lewy and Goldberg reported $^{586}_{No.10}$ eleven cases from their recent hospital practice. F. A. Strauch $^{586}_{No.14}$ communicated the case of an inn-waiter, aged 37, with primary sclerosis of the lower lip. A. S. Serduckoff $^{586}_{No.14}$ related a case of a young man, aged 23, with hard chancre of the right tonsil, and another, of a man aged 25, with a primary syphilitic erosion on the right side of the soft palate. Both of them had contracted the infection from smoking a cigarette in common in company with

syphilitic comrades. H. J. Lewy [586 No.14] reported a case of a *virgo intacta*, aged 16, a laundress, with primary sclerosis on the right side of the soft palate. M. A. Tchistiakoff [586 No.14] detailed a case of a youth aged 20, a pupil in a boarding-school, who came to him with hard chancres of the upper lip, roseola, etc.

Kleiner reports a case observed by Loewenhardt [336 No.22] of a chancre of the lip in a servant-girl, who applied to her cracked lips the same vaselin used by her master to dress a sore on the penis.

Rassler [16 Apr.16] found, in analyzing 630 cases of syphilis, 29 cases of extra-genital chancre,—23 on the lips, 1 on the tongue, 2 on the mucous membrane of the mouth, 3 on the mammæ. In 3 instances the primary sore occurred on the genitals, without connection having taken place; in 2 cases it was impossible to locate the primary lesion. The result of these investigations shows that 5 per cent. of all cases are due to extra-genital infection. According to other authorities, the proportion varies between 1 and 10 per cent., except in parts of Russia, where it is said to reach as high as 80 or 90 per cent.

An extra-genital chancre, as large as the palm of the hand, was shown by Pauly. [211 Jan.3] This lesion was situated on the forehead, and followed a wound from a blow. Over the left cheek-bone a second sore was also observed, which had developed a month and a half after the other. Although much resembling a chancre, it was diagnosed as a secondary lesion. The glands adjacent to both sores were enlarged.

Rabinovitch [26 Apr.1] reports an indurated chancre of the upper lip in an old lady 65 years old. The ulceration had been diagnosed as cancer. It healed promptly under mercurial plaster, but was followed by secondaries.

Von During, of Constantinople, [28 B.13,No.11; 26 June 1] noted within eighteen months thirty-one cases of primary infection of the anus and rectum. Such figures can only be explained by the unnatural sexual relations which obtain among Orientals. The patients belonged to the poorer harbor population of Constantinople. The initial lesions were as follow: In two cases, fissura ani specifica with induration; in four cases, parchment-like, shiny infiltration of the epithelial layer of the mucous membrane; one case, a ring-like induration. All the others were simple scleroses.

E. R. Palmer [224 Apr.23] mentions a case of inoculation following a wound received on the knuckles during a fight. The wound at first healed, but three weeks later became a large, indurated, oval sore, and was followed by an eruption of macular syphilides, corona veneris, and general adenitis.

Mazet [780 Jan.; 824 Mar.] reports a case of indurated chancre on the right upper eyelid, coincident with one in a state of spontaneous healing on the glans penis; the lesions, when seen, were about a week old. Ten days later a specific roseola developed, and, shortly after this, alopecia and mucous patches. The symptoms disappeared under mercurial inunctions.

Goldberg, of New York, [245 June] at a discussion apropos of a patient with an initial lesion of the finger, said that special interest was afforded by the apparently unusual occurrence that the epitrochlear glands were not enlarged, as was to be expected, but that the axillary glands were enlarged. He remarked that he had seen two cases of chancre of the finger—one at Lewin's clinic at Berlin, the other at the New York Hospital Dispensary (Bulkley's service)—where the same peculiar feature was to be observed. He further cited the explanation given by Lewin regarding glandular enlargement in these cases, namely, the superficial lymphatics of the fingers pass directly into the axillary glands, while the deeper lymphatics enter the epitrochlear glands. The experience of Keyes and Taylor did not correspond with that of Lewin. They reported that, of the twenty to thirty cases of initial lesion of the finger which they had seen, the epitrochlear glands were always primarily (*i.e.*, *per continuitatem*) implicated. Three cases of chancre of the finger without epitrochlear swelling have been reported by Lewin, [2093 Dec.,'91,Jan.; 45 H.3,p.508] who remarks that in tattooing near the hand the pigment is never found in the epitrochlear glands, but in the axillary.

As early as 1854 Sigmund [84 No.16,'54] reported a case of chancre of the finger with swelling of the axillary glands. Plummert [283 No.51,'79] reported a chancre of the thumb, on the outer side of the nail, with swelling and suppuration of the axillary glands. Robert [287 No.51,'79] found enlargement of the axillary glands in consequence of a superficial chancre on the forearm produced by tattooing. Robbins [9 Mar.5] observed axillary swelling with chancre of the hand. Lewin is the only one who has given an anatomical reason for this fact, the

opinions of different authors on anatomy, such as Sappey, Quain, Henle, Hyrtl, and others differing materially. Lewin's explanation does not seem to be correct. Sappey,[2094] who is to be considered the best authority on this question, says that the deeper (subaponeurotic) and the superficial (subcutaneous) lymph-vessels communicate with each other. He further states that the lymph-vessels which come from the fingers form three principal groups: 1. The median group, which consists only of a few branches and joins the two following. 2. The internal, or ulnar group, corresponding to the lymphatics of the fourth and fifth fingers, which group enters, as a rule, the epitrochlear ganglion. It may be double or triple, or it may be absent. 3. The external, or radial group, which always terminates directly in the axillary glands. An affection such as a chancre of the thumb, index and middle fingers should, as a rule, involve the axillary glands; while the epitrochlear should be affected in initial lesions of the fourth and fifth fingers. Sappey states that this is not a mere theoretical conclusion, but is based upon actual clinical observation. There are, of course, exceptions to this rule. In lesions on the radial side of the hands or forearm there may be an epitrochlear swelling, as, through the extension of the inflammatory process, new anastomoses between the different branches will be formed. Possibly, on closer observation, it will be found that in chancres of the first three fingers primary axillary swelling is the rule, and not the exception.

SECONDARY SYPHILIS.

Lassar[69 Mar.24] discusses the question as to whether the primary effects of syphilis are to be regarded as a local focus or as an expression of constitutional disease,—a question of decided importance in reference to the treatment of the early stages. The assumption that secondary syphilis is of a very grave constitutional nature is not always borne out by facts,—*e.g.*, a patient had for twelve to fifteen years a colossal syphilide on the upper thorax, without being in the least degree affected in her general health. No history whatever of previous syphilis could be obtained; it was only under antisyphilitic treatment that the nature of the syphilide was revealed and a cure effected. Secondary syphilides are to be regarded as especially grave only when they attack the nervous centres, or threaten by their localization the

whole system. Without any history, it will always be difficult to determine with what we are dealing: whether with a syphilide, lupus, or tuberculosis. As a case in point, an operation for lupus was performed ineffectually; all that the patient could tell was that, thirty years before, he had had an attack of gonorrhœa. Despite this lack of information, the bow-shape of the serpiginous syphilide indicated the specific treatment, under which a cure was made. In another case, the failure of treatment for acne led to the suspicion of syphilis, which was further intimated by the thick, foul scabs, the small swellings, vesicular and yet solid, which formed a kind of ring. The patient acknowledged that he had had an ulcer thirty-two years previously, which had been healed by the "hunger and sweat cure," with no subsequent symptoms; he was the father of a healthy family. Under antisyphilitic treatment but few traces of the disease remained.

Besnier $\frac{3}{\text{Feb.13}}$ records a case, as described by Bazin, of ulcerating tuberculous syphilides. The patient, when first seen, was in a state of profound depression, and covered with ulcers from head to foot. Besnier thinks that mercury should be used with great care in these cases, and always in conjunction with potassium iodide. Above all, local treatment is important; washing with a 1-to-1000 sublimate solution, and cauterization with nitrate of silver or pure "naphthol. camphore."

Chapotot, $\frac{211}{\text{Nov.22}}$ after observing three very interesting cases of icterus accompanying secondary syphilis, is of the opinion that icterus may be directly ascribed to syphilis in many cases where there is (1) absence of the ordinary causes of jaundice; (2) where there is coincidence of symptoms of the two affections in very pronounced form; (3) where the course of manifestations of both diseases runs parallel.

This icterus is probably due to the involvement of the mucous surfaces of the bile-ducts or of the duodenum, and makes its appearance at the outbreak of the second eruption, or at its recrudescence. The abuse of alcohol in such cases is undoubtedly nothing more than a predisposing cause.

Cautru reports $\frac{152}{\text{Jan.15}}$ a case where, with severe syphilis and bad general rheumatic condition, there were fever, recurrent sore throat, cervical and submaxillary adenopathy, conjunctivitis, and persistent mucous patches, which re-appeared on the cessation of treat-

ment. Then there was a return of the rheumatism, the patient being weakened by his pathological condition. Finally, there supervened a phlebitis of the internal saphena. He asks: Have we not a right to attribute to the syphilitic virus the return of the rheumatism, and, above all, the phlebitis? Why should the syphilis, which attacked the arteries with such intensity, spare the veins?

Lop [46 Mar.15] gives, in detail, some interesting cases in secondary syphilis attended with lesions of purpura hæmorrhagica; the case of a woman is mentioned where ulcerous syphilides of the face were cured by an attack of erysipelas of the face, corroborating the assertion of Ricard and Dupres, Lamarche, [2007 '86] and of Mauriac, that, when a syphilitic exanthem is unaccompanied by malignity or cachexia, a febrile erysipelas intervening is favorable.

TERTIARY SYPHILIS.

Neumann, [8 Sept.22] at the International Dermatological Congress in Vienna, September 6, 1892, discussed the results of his clinical observations in nine thousand seven hundred and forty-two cases of syphilis, whereof six hundred and sixty-five presented tertiary symptoms. He thought that his experiences showed: 1. The main cause of tertiary syphilis is utter neglect and inadequate treatment during the earlier stages; also constitutional diseases, such as tuberculosis, malaria, scurvy, diabetes, Bright's disease, and chronic alcoholism. 2. Tertiary syphilis is not to be considered exclusively as metastatic, but, in by far the majority of cases, as the product of residuary exudations left behind in the tissues, which, if treatment has been neglected, set up proliferation. 3. Tertiary syphilis occurs in 6.82 per cent. of all cases of syphilis, and appears most commonly in the third year after infection. 4. It commonly affects the skin, the mucous membrane, and the bones. 5. Endemic syphilis is not a disease *sui generis*, but an ordinary tertiary syphilis, with which individual cases of syphilis hereditaria tarda are to be classed. 6. There is no proof of hereditary transmission of tertiary symptoms to later generations. 7. The results of the examination of the blood are similar to those of the secondary stage; there is constantly present a highly degenerate state of the hæmoglobin, although the diminution of the red corpuscles and the increase of the white are less striking.

Hutchinson[806 Jan.] calls attention to the limitations of one set of tertiary lesions to one tissue. It may be to the skin, or to the mucous membranes, or to the bone; but it is exceptional for several different structures to suffer at the same time. A patient may have his skin affected over large areas by a superficial syphilitic lupus, but in such a case neither the bones nor the nervous system will suffer. If there be one node on the bone there will probably be others, and it is also probable that the skin will escape. One tissue may suffer severely for a time, and after an interval of years another be affected. As an explanation, he suggests that one lesion produces another by infection, and the infective material selects a material similar to that which gave it birth. Syphilitic lupus he regards as a local inflammation in a syphilitic subject rather than as part of the specific fever; and, since it is not contagious, there is no reason to believe that syphilitic virus is present. [The name should be discarded as unscientific and confusing.—J. W. W.]

Hallopeau[3 July 9] thinks that the most plausible explanation of the occurrence of symmetrically situated gumma is that they are not formed simultaneously, but that the lively irritation set up by the first draws the symmetrically opposite portion of the body into sympathy, and thus forms a most favorable medium for the attack of the micro-organisms. [It is probable, as stated above, that gummata are the results of proliferation in "residuary exudations, and not due to the presence of micro-organisms. It might be thought that the latter were themselves encapsulated during the secondary stage, and that the tertiary phenomena indicate that they have been set free; but this theory would not explain the non-contagiousness of tertiary lesions.—J. W. W.]

To the list of cases of keratoses in constitutional syphilis Engel-Reimers[4 p.336] adds the following: In 1877, a workwoman, 34 years old, who had been infected in March of that year by her husband, was admitted to treatment in the following August and September, on account of syphilitic paronychia of her fingers and toes, after having been previously treated with inunctions in private practice. Having infected her infant, whom she suckled, her breast was closely examined and found to be healthy. Six months later she returned to the hospital with large corneous layers, about the size of a dollar, on the nipples and on the areolas

of both breasts. These layers were fully one centimetre in thickness, and, when tapped with any hard substance, presented uniformly the hardness of a nail. Their superficial surface was flatly arched, of a dirty, grayish-yellow hue, and firmly adherent to the underlying skin. There was present, besides, a papulo-squamous syphilide. Over the lumbar vertebra and the sacrum the eruption was the thickest, and here, amongst the scale-like plaques, there appeared also a couple of small, crooked, typical, cutaneous horns, semi-lunar in shape and of the circumference of a pea. After carbolic ointment had been applied to the horny scales for about ten days, they became quite soft and were then easily removed by the forceps. The papillary bodies beneath were knobby and villous. The papillæ were one to one and a half lines in length. The horny mass itself consisted throughout of epithelial cells overlying each other, like tiles on a roof. Under painting with a 10-per-cent. solution of nitrate of silver and the application of ung. nigr., the papillæ returned to the normal size. The patient was treated by inunctions and soon dismissed cured.

Horny scales in the breast are of extreme rarity. In Luberts's collection there is but one case (Cruveilhier's), and that one did not represent, as in the foregoing case, a genuine breast-plate, but a circlet of small lumps, surrounding the nipple and facetted on the surface. [41 July 18] The horn-formation in the condylomatous stage is thus rare, because, as a rule, the proliferating epithelium is very quickly checked, partly in consequence of serous infiltration, and partly in consequence of superficial maceration. [13 Aug. 15]

Emile Bardier [1038 Dec. 25, '91] reports at length an extremely severe case of tertiary tuberculous syphilis of seven years' standing, with grave manifestations, rarely seen. Although there were lesions or scars over the whole body, it is noteworthy that not a single lesion had ever occurred on the hands and feet; not a scar was to be found there. Where tubercles or consecutive ulcerations had been, there were not alone scars, but also a retraction of the skin. Moreover, the external integument was adherent to the subjacent muscles, and caused veritable deformity. The projection of the triceps was not to be seen on the left arm, and the complete extension of the forearm was impossible. In six weeks the disease yielded completely under treatment by 0.02 gramme ($\frac{1}{3}$ grain) of

sublimate and 2 grammes (31 grains) of iodide of potassium daily, with wet dressings of sublimate.

Mraček described, before the College of Physicians of Lower Austria, $^{57}_{\text{May 22}}$ a case of right facial paralysis, severe headache, periostitis of the bones of the skull, anæmia, and emaciation accompanying the symptoms of secondary syphilis of extra-genital origin, the primary lesion being situated on the abdomen. Under treatment all the symptoms improved greatly, except the paralysis, which he diagnosed as not due to a syphilitic neuritis, but more probably to long-standing pressure on the facial nerve from a periosteal thickening in its canal of exit. The branch of the nerve supplying the ear-muscles was not implicated, proving that the lesion was neither central nor even intra-cranial. He gave an unfavorable prognosis for the relief of such paralysis, and pronounced the case one of great severity, since many of the tertiary symptoms were developed at the same time as the secondaries. He also mentioned a case of tuberculosis with syphilis superadded. Both diseases were much aggravated and ran a rapidly unfavorable course, which, he said, was usual when two such diseases were combined.

Ledermann $^{41}_{\text{Mar. 14}}$ reports a case where a deep, crater-like ulcer was developed on the tonsil ten months after the appearance of a chancre and a roseola. This was diagnosed as gummatous. The rapid course of the disease followed the inadequate treatment of only 15 inunctions.

In a young woman under Fournier's observation $^{3}_{\text{June 11}}$ symptoms of the greatest severity broke out three months after infection: a confluent papulo-tuberculous syphilide, covering almost her whole body; hypertrophic onychia, followed by shedding of every nail on her hands and feet; glossitis, complete alopecia, severe ophthalmia, and, finally, intense nervous and hysterical symptoms completed the picture. These symptoms yielded only after the most thorough and energetic treatment with mercurial injections and inunctions, iodide of potassium, etc. The only cause for this malignant form of the disease was the association of malaria, of five years' standing, before the syphilitic infection. Fournier has already called attention to the fact that malaria is a factor in malignant syphilis. Fortunato $^{531}_{\text{Apr.}}$; $^{906}_{\text{Aug. 25}}$ also mentions a case where a gumma appeared upon the shoulder, penetrated deeply, and brought about necrosis

of the acromion five months after the appearance of the initial sclerosis.

Jullien [3 Apr.23] observed, in a woman 30 years old, an eruption of small subcutaneous tumors, about the size of an olive, and attached to the overlying skin. They were distributed over the limbs and buttocks. The history of a chancre twelve years antecedent suggested the trial of a therapeutic test of injections of calomel, which in a few days established the specific nature of these symptoms. This case is interesting on account of its rarity; at this stage of syphilis, gummata are seldom seen unchanged during a period of a year and a half, as in this case. They might be compared to the lesions described by Mauriac under the name *erythèmes noueux syphilitiques*, except that the latter appeared early and were accompanied by a slight fever. In the matter of treatment, attention is called to the truly marvelous efficacy of a single injection of calomel.

Vogel, of Leipzig, [26 Sept.1] calls attention to a case reported by Maes, [2095 p.344] of a man aged 44, in whom, four months after infection, ulcerating gummata appeared on the dorsum of the tongue, which healed well under specific treatment. Six months later there had not been a relapse.

LOCALIZATION OF SYPHILIS.

Cerebro-Spinal System.—Boultoche [287 No.10] states that in 62 per cent. of all cases syphilitic myelitis develops in the first four years after infection, a more tardy development being very rare. Antisyphilitic treatment, after the early forms of syphilis of the cord have already appeared, seems problematical, but a forehanded and thorough treatment may be, to a certain extent, preventive. Chronic myelitis is more common than the acute or subacute form. The acute form appears sooner after infection, possibly within a month, and the prognosis is correspondingly unfavorable. The chronic form more commonly attacks the lumbo-dorsal portion of the cord. The lesions, anatomically and microscopically, are as manifold as the symptoms, and the prognosis is always very doubtful. Minar's statistics [2096 Sept.20,'91] show that in 1889, in Moscow, syphilis was four times more frequent in Russian men, and nine times more frequent in Russian women, than in Jews and in Jewesses. Likewise, tabes and paraplegia were more frequent in the same proportion in Russians as compared to Jews. It would be

more serviceable in establishing a relation between tabes and syphilis if observations were made concerning the presence of chancres or secondary symptoms in tabes. Bajenoff $^{94}_{\text{July}}$ considers paraplegia as due to three concomitant causes, viz., syphilis, hereditary tendency, and certain conditions of life in the city (cerebral exhaustion, absence of open-air work, etc.). General paralysis is much more rare among the Russian peasants.

An interesting case of syphilis associated with hysterical symptoms of violent character is mentioned by Fournier. $^{3}_{\text{Nov.18,'91}}$ The patient had paroxysms of crying and laughing, of violent character, excited especially by looking at anything sparkling or brilliant. They were accompanied by a painful feeling of constriction in the chest and marked weakness in the left arm. During his first stay in the hospital, he had daily periods of mental aberration, in which he flew into a violent passion and tried to kill any one near him. In the intervals he was perfectly sane. Fournier regards this as syphilitic hysteria. No other cause could be found, and the attack dated undeniably from the period of strongly-developed secondaries. Hudelo also reports a case from Fournier's service $^{3}_{\text{July 9}}$ of hysterical hemianæsthesia, with paresis and a hysterogenic pseudo-ovarian point on the left side. The patient was not hereditarily nervous, and never presented hysterical symptoms before the contraction of syphilis. The patient also suffered from intense headache, nasal pains, caries of the vomer and base of the ethmoid. His weakened cerebration, intense headache, and hemiplegia occasioned grave fears of meningeal lesions, consecutive upon the naso-cranial ostitis. Hudelo and Fournier both decided, however, that it was simply a superposition of hysteria provoked by syphilis.

[" Syphilitic hysteria " seems to me a meaningless term, conveying no idea of a specific lesion, if there be one, on which the nervous symptoms depend, and substituting, for frank confession of ignorance as to that point, a theory which has no other foundation than the co-existence of the two conditions.—J. W. W.]

Changes in the Blood.—Bieganski $^{45}_{\text{H.1; Aug.27}}$ ^{2} concludes, from an exhaustive investigation of the number and relative proportions of the white and red corpuscles of the blood in syphilitic persons, that (1) under the influence of the syphilitic poison the number of the red corpuscles does not vary for a long time; (2) the num-

ber of the white corpuscles increases; (3) of the white corpuscles, the increase is chiefly in those with one nucleus, those with multiple nuclei being correspondingly diminished; (4) the color of the blood (the proportion of hæmoglobin) is considerably less; (5) through the action of mercury, the number of red corpuscles is subject to numerous variations, caused by the greater or less thickening of the blood, and are independent of the general condition of the nutrition of the patient; (6) under the influence of mercury the number of white corpuscles diminishes, and the relation of the white to the red corpuscles becomes nearly normal; (7) of the white corpuscles, the number of those with one nucleus diminishes, and the percentage of multiple clear cells is greater; (8) the proportion of hæmoglobin increases under the influence of mercury; (9) in the true anæmia which follows the exhibition of large quantities of mercury the red corpuscles are subject to a change which chiefly affects their consistence (breaking up of corpuscles, megalocytes, etc.).

Affections of the Mouth.—Fournier $^{212}_{\text{Dec.10,'91}}$ separates the secondary syphilides of the mouth into two groups, namely, the moist and the dry. The first comprises the well-known mucous patches; the second appears at points on the tongue where the papillæ have disappeared, and forms little islets, as if the mucous surface had been shaven in these spots. To be studied, the lesion should be dried, and it will then be seen that it is not erosive. It may appear at any period of the disease. Fournier further insists on the importance of making careful diagnoses of these secondary lesions of the tongue, because there is a form of recurrent herpes which resembles closely a mucous patch, but which is only aggravated by the mercurial treatment so often employed against it. [I have seen many cases of this character, and regard them as among the most confusing in respect to diagnosis, and unsatisfactory in relation to treatment, of any of the many conditions which simulate syphilis.—J. W. W.]

The manifestations which syphilis displays on the tongue during the secondary stage may be confounded, according to Ducastel, $^{17}_{\text{Feb.11}}$ with a large number of affections of that organ, chief among which may be mentioned the smokers' patch, which is slightly protuberant, always red and smooth, without any swelling at the periphery. This patch may last for months and years. At

times the coloration becomes a bluish, pearly white, and, as it has a tendency to extend, it is sometimes described as buccal or lingual psoriasis. Kaposi at first considered buccal and lingual psoriasis as syphilitic. It is, however, frequently found to be due to simple irritation, especially in men of a gouty or rheumatic diathesis. It never occurs before the twentieth year nor after the sixtieth. Buccal leukoplakia is slower of development than mucous patches, and its color is more bluish white.

Among other affections simulating syphilis of the tongue, such as ichthyosis and superficial glossitis, is a disease of infancy, which was described first in France by Bridou and Gubler, and to which many names have been given: erratic rash, circinated herpes, geographical tongue, annulus migrans, etc. The tongue becomes covered with concentric rings, formed by small, red patches,—hence the name "geographical"; the senses of taste and touch are normal; sometimes, however, there may be slight hyperæsthesia (Caspary). Parrot suggests that it may be syphilitic, but this is more than doubtful. The disease might easily be mistaken for mucous patches of congenital syphilis.

Affections of the Kidney.—Suruktschi reports $\frac{586}{\text{p.8,'91}}$; $\frac{673}{\text{Apr.}}$ a case of diabetes insipidus of syphilitic origin, making only the third observation of the kind to be found in literature. The patient, a young man aged 25, had an extreme thirst, and passed daily about 6 litres (6 quarts) of urine having a specific gravity of 1004. There was no sugar or albumen present, and syphilis was not suspected till mucous patches made their appearance, ten days after admission to the hospital. One month after antisyphilitic treatment was instituted the diabetic symptoms completely disappeared, excessive hunger and thirst were no longer present, and the symptoms of syphilis disappeared, while the patient gained in weight and remained well for over a year after leaving the hospital.

In the course of a discussion on renal and pulmonary lesions, Jaccoud $\frac{17}{\text{Sept.6}}$ states that the kidneys may be implicated in all stages of syphilis, and that renal syphilis does not belong exclusively to the tertiary stage, although it is then that it is ordinarily recognized. It might readily be supposed that in this late form of renal syphilis the gumma is the most frequent manifestation; but this is not the case, amyloid degeneration being by far the most common mani-

festation. Next in order of frequency comes granular atrophy, and, third, the gumma. Wagner describes a fourth form, which he calls acute syphilitic glomerulo-nephritis; it is characterized chiefly by hæmaturia, and ends rapidly with uræmia. The amyloid kidney may be overlooked for a long time, and no albumen be found in the urine until uræmic symptoms develop.

The *premature* renal syphilis is seen in two forms. In the first, a quantity of albumen and morphological elements are observed constantly in the urine during the first six months of the disease; in the second, the whole picture of acute nephritis is displayed,—scanty, albuminous urine, anasarca, headache, etc. In the first form, the syphilitic element cannot fail to be recognized, but the renal lesion escapes notice if the urine is not examined. In the second form, syphilis is too often overlooked, and the patient dies under inappropriate treatment. Unless in a case of very old syphilis, both potassium iodide and mercury should be administered.

Pulmonary Lesions.—With regard to pulmonary syphilis, Jaccoud $\frac{17}{\text{Sept. 6}}$ describes two forms: 1. Diffuse sclerosis, characterized by bronchial catarrh; alternate areas of dullness and resonance on percussion over the points sclerosed and not sclerosed. 2. Circumscribed syphiloma or gumma, single or multiple; usually found in the middle third of the lungs, but occurring also at the apices. In such cases the microscopic examination of the sputum is indispensable in order to establish a diagnosis. A case related by Chomatianos, of Athens, $\frac{996}{\text{July 25}}$ shows how closely syphilis of the lungs may simulate phthisis pulmonalis. His patient presented all the symptoms of a typical phthisis,—violent cough, with muco-purulent, blood-stained expectoration, anorexia, great emaciation, night-sweats, etc., etc.; but the apices of the lungs did not show signs of disease in proportion to the severity of symptoms. On the contrary, all the pathological signs were to be found in the middle third of the lungs. On the right, absolute dullness and a pulmonary cavity the size of an egg; at the same level on the left, similar phenomena of less-marked degree. Two deep scars were observed on the outer surface of the thighs. These aroused suspicion, and a history of syphilis, ten years previous, was elicited. Added to this, the persistent absence of Koch's bacilli in the sputum led Chomatianos to diagnose the case as syphilitic phthisis; and a systematic and energetic antisyphilitic treatment with mer-

curial inunctions and potassium iodide worked such marvels with the then moribund patient that in six weeks he could leave for his home and take up his occupation, completely cured.

Cardiac Lesions.—Mraček [8 Sept.22] makes two pathological divisions of syphilis of the heart: such as are the direct products of syphilis, and such as necessarily develop as sequences of these products. The former appear, at times, as gummata; at times, as fibro-sclerotic myocarditis; and both mainly attack the walls of the left ventricle. The gummata, when encysted, remain long unnoticed, and are accidentally first discovered only at a post-mortem. The fibro-sclerotic myocarditis rarely affects the whole thickness of the wall of the heart. It begins first in the peri-vascular tissue, and clearly extends from the wall of the vessel outward. Nor is it alone the smaller vessels, but also the great coronary arteries of the heart, which can become diseased and show typical Heubner's degeneration; or else they develop, through the inflammation, numerous aneurismal bulgings and marked changes of their lumina. Even more gradual than the gumma is the callous degeneration of the myocardium. Clinically, the pathological effects on the heart, resulting from syphilis, are scarcely ever detected; almost half of the recognized cases have been discovered through autopsies after sudden death. In life its symptoms resemble those of hypertrophy, and occasionally a murmur may be detected over the cardiac orifices.

Leg-ulcers being so frequent in our hospitals and dispensaries, there is a great tendency to treat them according to a regular routine; but Mraček [57 Jan.3] urges a careful differential diagnosis between varicose and syphilitic ulcers of the leg. The typical syphilitic appearance is rare; frequently there may be no other demonstrable symptom than the ulcer. Moreover, a patient rarely presents himself until numerous remedial measures have utterly changed the clinical picture of the ulcer. Mraček's treatment is iodoform, or an ointment of red oxide of mercury and vaselin, 1-per-cent. strength, locally, and potassium iodide internally.

Syphilitic ulcers are situated on the inner and posterior surface of the leg, just below the greatest circumference,—frequently multiple. When recent, they are circular or elliptic in shape; when older, irregular. The floor of the ulcer appears scooped out, and is covered with necrotic tissue. The secretion is thin, hæmor-

rhagic, or ichorous; laudable pus is rare until healing begins. These ulcers are to be distinguished by the absence of varicosities; by their greater depth in proportion to their duration; by their painfulness, and by the infiltration and irregular sloughing of the edges. In varicose ulcers the edges are callous. The skin surrounding the specific ulcer is livid or copper-red; around a varicose ulcer it is often eczematous. Syphilitic ulcers seldom lead to hypertrophies, whereas pachydermata and elephantiasis constantly accompany the older varicose variety. Scorbutic ulcers are distinguished by the absence of inflammatory infiltration and by hæmorrhages. Ecthymata and the ulcers of glanders are usually easily distinguished by the history and general symptoms. Mraček offers no explanation as to why the most frequent seats of syphilitic ulcerations are at the junction of the lower with the middle third of the leg, and on the nasal septum, other than that it is due to the distribution of the blood-vessels. Indeed, it appears as if there could be, in these localities, a strictly-localized syphilis, without manifestations elsewhere. This is, however, but a late form of the disease, suppressed for twenty or thirty years, or possibly latent from birth It is also quite possible that the patient inadvertently—or intentionally, perhaps—deceives as to his previous history; as Sigmund says: "*Syphiliticus quisque mendax, donec probetur contrarium.*"

A case of gumma of the meatus, simulating a primary lesion, is reported by Pauly. [211 Apr.3] The sore had all the indications of a chancre, accompanied by enlargement of inguinal glands on both sides. Questioning brought out the fact that the patient had suffered from a chancre twenty years previously. Rasch [287 Aug.9,'91] cites a case in which a woman, manifestly afflicted with hereditary syphilis, suffered for sixteen years with a painful affection of the knee, which was found to be due to a loose body in the joint, about the size of a hazel-nut, composed of cartilage and bony tissue, and attached by a long pedicle. He is of the opinion that this was the result of a syphilitic arthritis, with villous proliferation of the synovial membrane, out of which latter the loose body was formed.

VACCINAL SYPHILIS.

Kaposi states [57 Apr.24] that, according to Lortz, there were, in 1880, of cases where syphilis followed vaccination, 300 in Italy, 120 in

France, 80 in Hungary, 36 in England, 85 in Prussia, 1 in America. For Continental physicians the subject is of importance. Numerous experiments have proved that a child with latent syphilis develops, after vaccination with pure vaccine-lymph, a vaccine-pock of normal appearance and course; even in the case of florid syphilis vaccine appears normal. Furthermore, experience shows that the pure lymph, taken from the normal cow-pox on a latent syphilitic patient, can be used for further inoculation without developing aught else but vaccine; that the syphilitic virus is not hereby transmitted. Nevertheless, there are exceptions, notably where particles of the blood and cellular tissue are mixed with the lymph, whereby it may be assumed that it is the former and not the latter which is the source of infection. Even the pure lymph may, sometimes, under conditions at present unexplained, carry infection, as is proved by the classic experiments of Cory, of London, who vaccinated himself on three different occasions with vaccine from infants with marked symptoms of syphilis, and each time with negative results; a fourth time, however, after a similar vaccination with pure lymph, he acquired roseola syphilitica. Perhaps the only explanation of this is to be found in the existence (at present acknowledged, through Lustgarten's investigations) of the syphilis bacillus, which may or may not be present in the vaccine. It is a safe rule, however, to take no vaccine from a child under four months old, before which age symptoms of hereditary syphilis will appear (generally within eight to twelve weeks); some physicians advise the limit of one year, while Pick advocates even ten years. The best preventive, however, of all danger of syphilis, and security against its inoculation, is to use animal vaccine. [The danger certainly does not cease to exist at the age of 4 months, merely because at that time symptoms of syphilis have not made their appearance. Such a rule is misleading and, if applied in practice, might be disastrous.—J. W. W.]

Rosenthal [69 Feb.11] describes the case of a young girl with undoubted vaccinal syphilis. Two weeks after the vaccinal ulcers had dried there arose in the same spot several pustules, followed by a painful efflorescence. When the patient came under notice she presented all the symptoms of syphilis: eruption, glandular swellings, ulcerated tonsils, etc., etc. Two months later, pronounced syphilitic rupia appeared, which, however, yielded completely and rapidly to

specific treatment. The family and personal history excluded any probability of syphilis hereditaria tarda. Peter [41 Mar.14] observed a case of tuberculous ulceration which closely simulated vaccinal syphilis. The patient, a boy aged 4, presented symptoms of a phlyctenular keratitis, a rupial eruption at the corner of his mouth, and an apparent serpiginous syphilide on his shoulder. The parents maintained that these manifestations followed immediately after vaccination. Hereditary syphilis was in every way excluded. Specific treatment had no effect; on the contrary, glandular enlargements ensued, and the case was finally diagnosed as tuberculosis, on account of the small nodules to be seen in the eruption round the mouth and on the shoulder. Lewin stated that in vaccinal syphilis the infecting pustules leave deep scars, which were not here present.

Under the name "Infantile Vacciniform Herpes," Fournier [212 Dec.10,'91] describes an affection which is always confounded with syphilis. It is an eruption which, at first vesicular, becomes papulo-erosive, next presents a vacciniform appearance, and at last becomes syphiloidal. Its usual seat is near the genitals, in the folds of the skin. It resembles a vacciniform eruption exactly in size, form, coloration, and basin-like shape; then the vesicles break, the centre degenerates excentrically, and there remains an erosive surface, which assumes a syphiloidal aspect. Its etiology is still obscure; it is an affection of earliest infancy, frequently appearing after severe attacks of diarrhœa. It certainly is not syphilis, and should not be treated with mercury, but with dry insulating powders.

RE-INFECTION.

Hudelo [287 Nos.5,6] states: 1. That a sufferer from syphilis is, during its entire course, even in the tertiary stage, absolutely immune from re-infection. 2. That this immunity begins, as a rule, with the incubation of the chancre; but occasionally, during the first days of this stage and, more rarely, during the whole incubation period, it is lacking. With the development of the indolent bubo immunity is firmly established, and at the outset of constitutional symptoms it has already been established for some time. These conclusions have perhaps only a provisional value, and further attempts at an abortive treatment of syphilis through opportune excision of the primary sclerosis are warranted by our present ex-

perience. (See Renault, under "Treatment," page 67). 3. Once developed, this immunity never fails. 4. Re-infection is perhaps possible in hereditary syphilis, but down to the present day no case is known. Kopp $\frac{336}{\text{July 2}}$ calls attention to the fact that Hudelo has made no mention of the natural immunity of some individuals against syphilitic infection, dwelt upon by certain authors, nor of "Colles's immunity." [The immunity of the children of syphilitic parents, even when they present no other evidence of having inherited the disease, is among the most interesting of the remote constitutional effects of syphilis.—J. W. W.]

At the Société des Sciences Médicales de Lyon, Pauly $\frac{211}{\text{Feb.}}$ presented a case of syphilitic re-infection. The patient had a chancre of the frænum and of the lip in 1877, followed by alopecia and several mucous patches. Two physicians had examined him, pronounced the case syphilis, and treated him for six months. This first attack of the disease had been cured for eight years. His present condition showed well-developed secondaries, which had appeared two months before. As primary lesions two cicatrices were found, one of which was still indurated. The original sores had appeared eight months before. There was some mistrust of the diagnosis in the first attack. Cordier had no doubt as to the possibility of syphilitic re-infection. Pospelow $\frac{151}{\text{May}}$ details minutely the history of a patient who contracted syphilis in 1882, followed by all the usual sequelæ in a marked degree; at the end of two years the symptoms had entirely disappeared. The patient was kept under observation two years longer, and, no evidence of syphilis appearing, consent was given to his marriage. Within a year a healthy child was born at full term. One year after marriage he was obliged to be separated from his wife for three years, and near the end of this time resorted to illicit intercourse. Twenty-eight days later, two lesions appeared near the base of the penis. He was kept under careful observation, and, on joining his wife, was advised against connection, which advice he did not heed. Later, all the secondary symptoms developed in a most typical manner, even more pronounced than at the previous attack. The wife being brought for examination, was found to have syphilitic lesions appearing, thus giving an additional proof of the genuineness of the case.

A case of re-infection after twelve years is reported by Gorski,

of Lipovetz. [520 No.24; 109 Aug.] The second attack was much more severe than the first, showing that the patient's susceptibility toward the syphilitic virus was not diminished. Milligan [11 May] also reports a case in which the first chancre was situated on the forefinger of the right hand, and the second on the right nostril.

TREATMENT.

There are still a goodly number of patients and a certain number of physicians who believe that there is no necessity for treatment in syphilis, or at least that it is needful only in particular cases. As a reply to this view, Fournier [212 Dec.10,'91] states that after treatment the graver cerebral and osseous lesions are never found in such proportion as where treatment has been neglected. On the other hand, one-third of the cases of cerebral syphilis have been preceded by a benign second stage; that is to say, there is no warrant for a favorable prognosis after a benign and mild secondary stage, and syphilis, even in the mildest forms, should always be thoroughly treated. In all probability, those grave manifestations which we occasionally see in cases where absolutely no previous history of syphilis is to be found are the results of neglect of initial symptoms, which, on account of their benignity, have escaped notice.

Duration of Treatment.—Kaposi [57 Apr.17] denies that any time may be fixed beforehand for the duration of the treatment of syphilis. Fournier gradually advanced from advocating six months mercury and three months potassium iodide to three or four years under a methodical and energetic treatment with the same drugs. There have been cases, Kaposi states, where syphilis of the skin, nerves, or brain has made its appearance even fifteen years after the first treatment; which makes the question reasonable whether or not treatment should continue throughout life. A negative answer has been given by many prominent authorities, such as Diday, Doyon, Sigmund, Caspary, Kaposi himself, and many others. At the first appearance of the disease, let the treatment continue until all symptoms disappear, and then let it cease; and only in the case of a relapse with genuine syphilitic symptoms let the treatment be resumed, and again cease with the symptoms. Should certain visible symptoms appear, a renewed general treatment is not always necessary, as a local application will often suffice not

only to cure the disease, but also as a placebo, *e.g.*, before marriage. There is no reason nor justice in keeping up, in blind conservatism, an unstinted administration of mercury and iodide where no objective or subjective symptoms appear. May not the indiscriminate use of mercury and iodine be responsible for the frightful number of brain and nerve diseases which accompany syphilis? The upshot of this indefinitely-continued treatment is the increasing number, in these later years, of mental invalids, who, in the belief that they are never to be freed from infection, lose all energy for work, and despair of doing their duty to themselves or to society by rearing a family. If Neumann's histological proof, that infiltration of the capillaries continues for months, be urged as a justification of persistent treatment, the answer is, that the healing power of mercury also lasts quite as long. Kaposi is in favor of administering mercury by inunctions, and only where these are impracticable should injections be used. [This modified expectant treatment of syphilis is only less dangerous than the expectant treatment pure and simple. It deserves and should receive the unqualified condemnation of every one who has contrasted the average course of syphilis in dispensary- and hospital- patients, who disappear during the absence of symptoms, and those of the same disease in private practice, where energetic, methodical treatment is employed.—J. W. W.]

Lang [169] Jan. again emphasizes his caution, first uttered at the International Congress at Berlin, in regard to the close observation of all symptoms, both previous and attendant, in cases where any of the preparations of mercury are exhibited. When a syphilitic patient is afflicted with any other severe malady, such as nephritis, tuberculosis, malaria, etc., and when he has any ailment, confessedly independent of syphilis, there must be no mercurial treatment, or else the system should be first strengthened by a due preliminary cure. If there be merely a derangement of the intestinal canal, this must be regulated before any mercury is administered. It is an inviolable rule first to heal all lesions or ailments of the oral cavity. Kidney affections, which usually develop in the early stage of the generalization of the disease, are to be considered, where other etiological factors may be excluded, as either the direct effect of the syphilitic virus in the substance of the kidney, or as the excretion of the metabolic products induced

by the virus. In the former case the nephritis may be infectious; in the latter, purely toxic, or syphilo-toxic. Such kidney affections demand immediate antisyphilitic treatment, often mercurial; but, be it observed, nephritis may be of mercurial toxic origin.

As concerns mercurial nephritis, it is to be remembered that it develops assuredly more often under an antiluetic treatment than is commonly supposed. Fürbringer [2091/'85] has shown that the ordinary mercurial treatment can, in fact, induce the secretion of albumen. Lang has found albuminuria occurring not infrequently during even a mild use of mercury, so that the presence of albumen in the urine can afford as decided a symptom of poisoning as affections of the mouth or of the intestinal tract. Mercurial treatment, howsoever administered, demands the closest attention, not alone to the oral region and to the intestinal tract, but to the kidneys. So far as Lang's experience goes, in thousands of cases, oleum cinereum, used rationally, offers no serious risk. Kaposi's report of a fatal case after injections of this oil greatly lacks proper detail. Moreover, Lang claims to have shown [8/No. 43,'90] that Kaposi's later accounts of this case are radically false, and possess no scientific justification whatsoever. The same is true of Hallopeau's case. In both cases the injections and doses were excessive.

The mixtures of calomel, thymol-acetate of mercury, or salicylate of mercury in mucilage of acacia, oil, paraffin, glycerin, and the like, do not permit an accurate measurement of the strength of the injections, because of rapid settling, varying fluidity, etc. In 1 cubic centimetre (16 minims) of the 30-per-cent. oil there are 0.369 gramme ($5\frac{3}{4}$ grains) of mercury; in the 50-per-cent. preparations there are 0.810 gramme ($12\frac{1}{2}$ grains); the latter Lang prefers. The injections are made, almost without exception, deeply subcutaneous under the skin of the back, rather than in the nates. Of late years Lang administers small doses, at short intervals. His ordinary injection dose is 0.05 cubic centimetre ($\frac{4}{5}$ minim) injected in two different spots every week until the symptoms have disappeared. Despite the comparatively small weekly dose of metallic mercury, the effect is very marked and uniform. In other cases, where a quicker effect must be obtained, the injections should be given several times during the first week, at intervals of three to four days. Severe cases of lichen syphi-

liticus, which had remained unaffected by more than 40 inunctions, were successfully treated with oleum cinereum, under which, moreover, although its operation is somewhat slower, recurrences of the disease are less frequent and more mild. Leichtenstern [116 Aug.,'91] is convinced that salicylate of mercury has a prompt, searching, energetic effect, but that in a certain number of cases, and a relatively high number too, it wholly fails, and is far surpassed in thoroughness and sureness by oleum cinereum.

Jelks [61 Dec.20,'90] inclines more to the use of the iodides at first, and uses mercury when these fail to relieve the case. In all the later manifestations of the disease he uses only the iodides. He has seen cases of cerebral syphilis made manifestly worse by mercurial treatment. In using mercury, he prefers the ung. hydrarg., 50 per cent. strength, and administers 1 drachm (4 grammes) by inunction every night, reducing the dose one-half, or stopping it altogether, at the slightest evidence of salivation. When inunctions are impracticable, he uses the protiodide in $\frac{1}{4}$-grain (0.016 gramme) doses. Potassium iodide he administers in the form of the saturate solution, 1 minim (0.06 cubic centimetre) being equal to 1 grain (0.065 gramme) of the salt. A dose of 3 to 10 grains (0.19 to 0.65 gramme) is insufficient. He uses 15 grains (0.97 gramme) at the first dose, and increases 1 grain (0.065 gramme) a day until the manifestation which called for it has disappeared. In the graver forms of nervous syphilis, or in gumma of the pharynx, he begins at once with 50-grain (3.24 grammes) doses. There is no limit to the dose of the iodides, save that which is indicated by its effects.

E. Finger discusses acute iodism and its dangers in syphilis. [520 No.24,'91] The headache may reach an alarming intensity; symptoms of cerebral compression, vomiting, vertigo, delirium, staggering gait, somnolence, and coma may supervene. One case showed alarming depression of the heart's action. Neuralgias of the cerebral nerves often occur. These symptoms are probably due to an increased cerebral circulation in vessels which have undergone specific alterations. Consequently, caution is necessary in the administration of iodides in patients showing cerebral symptoms. The best method of obviating unpleasant effects is to give the iodide in milk; belladonna may be added, as well as potassium bromide.

Arthur Cooper [6 May 7] very properly protests against the following methods of treatment, which interfere with the diagnosis of syphilis: (1) the application of irritants (chiefly nitrate of silver) to a doubtful sore; (2) the application of irritants (chiefly iodine-paint) to the groins; (3) the untimely administration of mercury.

The application of nitrate of silver to a sore of uncertain nature, apart from the unnecessary pain and irritation produced by it, is more especially to be avoided because it is so liable to cause inflammatory hardness, which may be either itself mistaken for syphilitic hardness, or may mask true syphilitic hardness. Irritation of the skin over inflamed glands is to be avoided for two reasons: (1) because suppuration may be induced; and (2) because so much infiltration and hardening of the skin and cellular tissues may be set up as to hide the enlarged glands of syphilis, if that disease has been contracted. Mercury should not be given while the diagnosis of a venereal sore remains in doubt; because the drug may either so modify the early signs of syphilis as to render them difficult to recognize, or perhaps may even prevent some of them altogether.

Mercurial Injections.—Raymond, [100 July 9] after giving the history of mercurial injections in France, announces himself a firm believer in their efficacy, although not to be invariably employed any more than any other method of treatment; nor reserved till the last extremity. After numerous trials of preparations of the salts of mercury, soluble and insoluble, those which furnished the best results and were least likely to be followed by severe local pain or abscesses were either a solution of the yellow oxide of mercury (about $1\frac{2}{3}$ grains—0.10 gramme) in liquid vaselin (about 15 minims —1 gramme), the ordinary single dose; or "benzoinated oil," as follows: metallic mercury, 20 parts; tinct. benzoin, 5 parts; oil of vaselin, 1 part; to be made into an emulsion, and a quantity containing about $1\frac{1}{3}$ grain (0.09 gramme) of metallic mercury to be injected. These doses, however, should be tentatively less at first. Injections should be made deep into the nates, and never close to a syphilitic lesion. The advantage of the injections is that the physician knows with absolute certainty how much mercury he administers; and the treatment can be carried out among private patients with much greater secrecy. The symptoms disappear so rapidly that patients remain as an expense to the hospital for a

much shorter time. (Lewin states that, under this treatment, the time in the hospital was reduced from six weeks to four). Furthermore, this form of mercurial treatment is not restricted by disorders of the digestive tract; although carelessness, here as elsewhere, may produce ptyalism and digestive disorders. Injections are indicated whenever the treatment must strike hard and quickly, as when an important organ is endangered; when the digestion is disordered; when the skin will not bear inunctions; in pregnant women; and when the secrecy of treatment is obligatory. The disadvantages are: the slight local pain of the injection and the possibility of abscesses; these most often occur in diabetes and albuminuria, which diseases, therefore, contra-indicate injection treatment. If abscesses form, let them remain unmolested, to be re-absorbed, being aseptic, or to open spontaneously. Raymond mentions Martineau, Balzer, Caire, Besnier, Raugé, and many others in France as supporters of this method.

Jullien $\frac{21}{\text{Apr.3}}$ reports favorable results from injections of about $\frac{3}{100}$ grain (0.00195 gramme) of succinimide of mercury. The injections were not painful up to the fifteenth or twentieth injection, when they became slightly irritant. He adds, however, that, in rapidity of action, the succinimide is not to be compared with the peptonate of mercury. Manganotti $\frac{507}{\text{No.1}}$ claims great success with injections of yellow oxide of mercury. De Michele $\frac{507}{\text{No.1}}$ advocates the use of calomel injections.

Gold, of Odessa, $\frac{703}{\text{May 2}}$ claims to have treated 328 cases of syphilis, by subcutaneous injections of the yellow oxide of mercury (210 cases) and of the salicylate of mercury (118 cases), and to have made 1609 injections without producing a single abscess, although infiltrations occurred in a few cases. He believes that the salicylate of mercury is altogether the best insoluble preparation of mercury for hypodermatic administration in syphilis. The doses that he employs consist of 1 grain (0.065 gramme) of the oxide and $1\frac{1}{3}$ grains (0.086 gramme) of the salicylate of mercury.

Letzius, of Dorpat, $\frac{21}{\text{No.4,'91}}$ claims to have obtained favorable results with the salicylate of mercury. He has employed this remedy in twenty-four cases of secondary syphilis, and in only one of tertiary syphilis. The formula is 1 part of the salicylate and 10 parts of liquid vaselin. The injections are usually made, every seven days, into the gluteal region. Twenty-five patients

received 126 injections. The author found that, usually after 2 or 3 injections, the secondary eruptions commenced to disappear; while, after the fourth or fifth injection, the broad condylomata were entirely cured. Recent syphilitic manifestations required usually only from 3 to 6 injections. In a case of cerebral syphilis he claims to have obtained a remarkable curative result, the symptoms rapidly disappearing after 4 injections of the drug. Finally, the author says that this method has never been followed by any local inflammatory action, abscess, or toxic symptoms, while stomatitis occurred but rarely, and was in no case severe.

Migneco, of Catania, $\frac{589}{\text{No.115,'91}}$ has, with advantage, used the thymol-acetate of mercury in eighteen cases of syphilis, and has made 250 injections without producing a single abscess. The author injected a Pravaz syringeful of a $7\frac{1}{2}$-per-cent. watery suspension of this drug in a little mucilage.

The propriety of operating in certain cases is, in the experience of every surgeon, counteracted by uncertainties of diagnosis; an ulceration, a tumor of ambiguous identity, makes one suspect cancer, without casting aside all waverings toward the side of syphilis. The surgeon should, in such a case, institute a course of treatment to throw light as rapidly as possible on the obscure points. Under these conditions, Jullien $\frac{14}{\text{May 7}}$ says he cannot too vehemently proclaim the superiority of calomel injections according to the Scarenzio-Smoinoff method: $1\frac{1}{2}$ grains (0.097 gramme) of calomel suspended in 15 grains (0.97 gramme) of liquid vaselin, thoroughly sterilized, and injected once into the gluteal muscles under aseptic conditions. How this acts we do not know; but no one can deny the profound modification which it exercises upon a syphilitic neoplasm, no matter what has been its duration. In five cases which he cites he determined whether a tumor was a manifestation of syphilis or not,—in short, whether or not operation was indicated.

Calomel by injection presents, then, in the highest degree, the qualifications of a test-medicine. No argument can be brought up in opposition; and if the surgeon does not utilize this excellent method, it is not—it cannot be—that he condemns it, but that he is ignorant of it. It may be discarded in the methodic, prolonged treatment of syphilis, but all its inconveniences are obliterated by

two indubitable facts, in the presence of doubts concerning a malignant degeneration, where "delays are dangerous." These two facts are: 1. That a therapeutic diagnosis of syphilis is clearly defined in eight days by injection of calomel. 2. In case of negative results, this treatment has not impeded the necessary operation in the slightest degree, and does not in the least complicate its results. However, it must not be used blindly, and it is best not to employ it in cases of marked albuminuria. [If further experience confirms these observations, it will be one of the best practical results following the excessive (and unnecessary) use of hypodermatic treatment which has been the fashion for a year on certain parts of the Continent.—J. W. W.]

Eichler, of San Francisco, $\frac{9}{\text{Aug. 20}}$ has employed the bichloride of mercury, in hypodermatic injections of $\frac{1}{12}$ grain (0.0054 gramme), with great success in the early treatment of syphilis. The routine which he adopts is to make the injections daily for twelve days, then give a week's rest, and then 12 more daily injections, followed by another respite of a week, and 12 more injections. These 36 injections he has so far found sufficient to hold the disease completely in check. He has only once had an abscess follow injection; his freedom from this mishap he attributes largely to his strict aseptic precautions, and to the use of a fine, long needle, which injects the solution deep into the tissue. Injections are made preferably on the back, between the shoulder-blades.

The solution which he uses is as follows:—

℞ Hydrarg. chlor. corrosivi, . . . gr. j (0.065 gramme).
Glycerini,
Aquæ, ... āā f℥j (3.70 grammes).—M.
Sig.: Inject 10 minims daily.

Ten minims (0.62 cubic centimetre) contain gr. $\frac{1}{12}$ (0.0054 gramme) of corrosive sublimate.

The conclusion which Linden $\frac{498}{\text{v. 34, No. 3}}$; $\frac{126}{\text{July 15}}$ reached after 305 urinary analyses, 237 of which were made after injections of salicylate of mercury (10 per cent. in vaselin), 8 after injections of calomel, 32 after internal treatment, 19 after inunctions, and 9 after mixed treatment, was that the absorption of mercury is very rapid. Two hours after injection it can be found in the urine; the amount increases for the following twelve hours, and then diminishes during the next two or three days. In 24 per cent. of

the cases, slight traces of mercury were found two months after cessation of mercurial treatment, but not later. The appearance of the mercury is more tardy after inunctions or internal treatment.

Neumann [650 Mar.3] treated last year 37 patients—21 men and 16 women—by subcutaneous injections of a solution which Ludwig prepared as follows: 10 grammes (2½ drachms) of asparagin are dissolved in warm water, and oxide of mercury added until no more dissolves. The solution is filtered when cold, and the amount of mercury is estimated. It is then diluted to the required strength of 1 or 2 per cent. Unlike the preparation which Wolff used with success more than ten years ago, it contains no excess of asparagin. The injections were made once a day, with strict asepsis, mostly in the interscapular region, 1 cubic centimetre (16 minims) of the 1-per-cent. solution, corresponding to 0.01 gramme (⅙ grain) of mercury, being used. Only once was there any induration at the site of the injection. The injections were well borne, and the patients gained considerably in weight. Stomatitis was observed once, and blood in the stools once. In 1 case a macular syphilide appeared during the treatment. The unpleasant symptoms noted above disappeared on omitting the drug for a short time. Of the 37 cases, 30 had various syphilides and 4 extensive condylomata. One only belonged to the tertiary period (cutaneous gummata). Two cases, with the initial lesion only, were treated prophylactically, but in 1 case a syphilide appeared. The eruptions faded in about two weeks, and disappeared in from three to four weeks. The average number of injections was 26.5, and the average duration of treatment 40.1 days. Three only relapsed. The patient with cutaneous gummata afterward gave birth to a healthy child. Potassium iodide was given to this patient for several days, as some painful infiltration occurred at the site of injection. Tables setting forth details of the treatment are given. The especial advantage of this drug is that it gets quickly into the circulation, that it rapidly influences the syphilitic processes, and that it is speedily eliminated.

Tommasoli [505 Mar.5; 2 Apr.2] has conceived the idea of treating cases of syphilis in its secondary stage by intra-muscular injections of lambs' serum. The serum was separated simply by allowing the blood to stand for twenty-four hours on ice, the amount used for each injection being not less than 2 cubic centimetres (32 minims)

and not more than 8 cubic centimetres (2 drachms). The treatment was applied in six cases, five of which presented various cutaneous manifestations, and the sixth had, in addition, a periostitis of the left external malleolus. The number of injections in all was 64, each receiving at least 3 injections, and one of them 13. The operation was followed by a slight rise of temperature and a circumscribed, painful induration at the point of injection. The amount and duration of this local inconvenience varied in different patients, but was only in one case (the sixth) so severe as to preclude further treatment. As the apparent result, the author states that the secondary eruptions rapidly and completely disappeared. Kollman, $^{69}_{\text{Sept.8}}$ in reply to this statement, declares that his experience with this agent yielded no favorable result, either in rendering the symptoms more tractable under ordinary syphilitic treatment, or in producing of itself any improvement whatever. As a rule, these injections were followed by no reaction, either local or general, and mercurial inunctions had to be resorted to before the patients showed any improvement. He concludes, therefore, that injections of blood-serum of animals immune by nature from certain diseases cannot cure these diseases in man. $^{41}_{\text{Apr.4}}$ $^{69}_{\text{June 10}}$ $^{57}_{\text{July 10}}$

A case of syphilitic chorio-retinitis is reported by Abadie $^{3}_{\text{Apr.27}}$ which resisted all general mercurial treatment, and was made worse by the administration of potassium iodide, but which was finally much benefited by subconjunctival injections of 1 drop of of a 1-to-1000 sublimate solution.

Moncorvo and Clemente Ferreira, of Rio de Janeiro, $^{2097}_{\text{'97}}$ submit the following conclusions as to the treatment of infantile syphilis: 1. The hypodermatic method must henceforth be received. 2. Among the various mercurial preparations employed in forty-seven children, who received 259 injections, preference is given to gray oil among the insoluble salts, and to corrosive sublimate among the soluble. 3. The injections of both preparations were perfectly well borne and notably beneficial. 4. The mercurial injections were always preceded by careful antiseptic measures, an interval of four days being generally advised. 5. The results obtained by these injections have been favorable, and their efficacy has been in no degree inferior to other modes of treatment. 6. Cutaneous syphilides, gummata, etc., are more

quickly influenced by mercurial injections, but glandular affections are more slowly acted upon. 7. As a general rule, the hypodermatic use of mercurials is well borne by infants, and is free from the ordinary accidents, such as salivation, stomatitis, intestinal disturbance, etc.

De Amicis [45 Jan.; 1 Apr.23] gives a formula for the hypodermatic injection of mercury, which he has used with great success. He injects a 1-per-cent. aqueous solution of succinimide of mercury, to which he adds a 1-per-cent. solution of cocaine. It yields good results in both secondary and tertiary lesions. Its activity is as great as that of the bichloride, and it produces less pain and irritation.

Treatment for Buboes.—After observations on Welander's method of injecting benzoate of mercury into buboes, as practiced at Pick's clinic, in Prague, Spieschka [45] reports that out of sixty-two cases twenty-three were completely cured by means of the injection alone. Among these cases were many with considerable glandular enlargement, and in four cases perceptible fluctuation. The injection was followed by considerable pain, a moderate rise of temperature, and increased inflammation.

In some cases pus exuded through the puncture made by injection. Even abscesses of considerable size disappeared, after one or more injections, in twelve or, at the most, thirty days. In twelve cases a slight incision was made, in addition to injection, on account of fluctuation previously existing or arising after the injection. In these cases the wound was kept open with iodoform gauze, and washed out with 1-to-1000 sublimate solution at each dressing. These cases were healed in twenty-eight days. In a third group, the injections were employed previous to incision and to curetting, where, on account of the size of the swelling, or the marked fluctuation, re-absorption could hardly be expected. In these cases the injection rendered the field of operation, as it were, aseptic, hastened the involution of the infiltrate, and liquefied the contents of the abscess, so that extirpation of the glands was facilitated. Healing took place in thirty to sixty-six days. Spieschka favors this method, since it is more conservative than purely surgical treatment, but Jadassohn, [336 Sept.17] in reviewing the article, says that it has been his experience that, in operating after the injections, firm and tenacious peri-adenitic adhesions make the operation more difficult.

Mercurial Inunctions.—Of the four methods of administering mercury,—by friction, by ingestion, by subcutaneous injection, and by fumigation,—Fournier [100 Nov.26,'91] gives, at exhaustive length, minute directions for its administration by friction. This method he chooses not because it is the best, for circumstances may require the administration of each and even all, but because in its operative technique it demands great care and close observation of the tolerance of the patients. The most favorable locality is the inner surface of the thorax, avoiding, however, the armpits, which, like all hairy portions of the body, absorb mercury with disproportionate facility. As a striking contrast to the skillful methods of administering mercury now in use, Fournier describes its administration for syphilis in the fifteenth and sixteenth centuries, when the unfortunate patients were debarred from the least breath of air, and were shut up in superheated rooms so saturated with mercurial fumes that the very wells were black, on whom the inunctions were performed before a blazing fire, and to whom were administered, in addition, no end of tisanes, laxatives, minoratives, dissolvents, digestives, eradicatives, sarsaparilla, etc. Naturally, frightful salivations followed, but they were hailed as blessings, and could be neither too intense nor too prolonged. Astruc, a moderate in his therapeutics, ceased his frictions when his patient reached the point of spitting 4 to 5 litres (quarts) a day. After the friction, the patient was put to bed and clothing piled on him to create perspiration, and, as "Sorrow's crown of sorrow," he was strictly enjoined to be gay and cheerful.

Last year Oussass suggested the application of warmth in the treatment of syphilis. He now describes [26 Mar.] the case of a young man, aged 17, who had acquired syphilis from his wet-nurse. Since the age of fifteen he suffered from persistent headache, which did not yield either to mercury or to large doses of iodide of potassium. His condition was slightly improved by a residence in the South. Oussass combined mercurial friction with hot baths administered daily, and obtained excellent results in a very short time. Tarnovski thought that the benefit of the baths was due to the more rapid elimination of the mercury which they promoted, whilst Stepanof held that the baths administered during and after the mercurial treatment increased the receptivity of the drug.

Finger [341 Feb.5; 1 Apr.23] advocates the use of baths in the pustular and

ulcerated forms of the disease. He considers the absorption of mercury in considerable quantity as the first advantage of this method, its local action upon the lesions themselves being the second. He dissolves 2½ to 8 drachms (9.72 to 31 grammes) of bichloride of mercury in about 15 ounces (450 grammes) of water, and adds the whole to a bath having a temperature of 78° to 80° F. (25.6° to 26.7° C.). This temperature should be maintained by the addition of hot water. The patient remains in the bath from half an hour to two hours. It is taken daily, and is to be followed by an hour's rest in bed. If the lesions are only upon one limb, an arm- or foot- bath will be sufficient. For this, 1½ to 3 drachms (5.83 to 11.66 grammes) of the bichloride should be used. For children, the author advises the application of mercurial plasters. The back, chest, arms, and legs are surrounded in definite rotation with the plasters, which are left *in situ* for several days until they fall off spontaneously. Treating of the hypodermatic method, he calls attention to the superiority of the intra-muscular method over the subcutaneous injections of insoluble salts. He warns against the danger of cumulative action in these cases. The mercurialism cannot be met except by surgical means, involving an incision over the site of the injection and removal of the injected material. He advocates the use of a 1-per-cent. solution of corrosive sublimate plus a 20-per-cent. solution of common salt as the best preparation for injection. A solution composed of sozoiodolate of mercury, 15 grains (1 gramme); potassium iodide, 25 grains (1.62 grammes); distilled water, 2½ drachms (9.37 grammes), is the most energetic, according to him, and is sufficient, being injected five to six times, at intervals of a week, to accomplish a complete cure.

A remarkable case of acute cutaneous mercurialization is reported by Mauriac. $\frac{100}{\text{Aug. 9}}$ The patient, a young man of 18 years, suffering from a papulo-erythematous syphilide, left the hospital almost cured after a course of treatment consisting of 0.03 gramme (½ grain) of protiodide of mercury thrice daily; at no time showing any mercurial symptoms. However, in a few days he had a second outbreak of the syphilis, more severe than the first, and returned to the hospital, where he was treated this time with inunctions of 1 drachm (4 grammes) of mercurial ointment daily. His skin was naturally very soft and delicate, and at the end of

the fourth day the skin in those parts which had been rubbed with the mercury became a lively red, as in eczema rubrum, and in less than twenty-four hours the entire surface of his body was covered with a scarlatiniform eruption of an extraordinarily intense color. The temperature rose quite high, and the pulse became very rapid. A remarkable fact was that, in this mercurial intoxication, the mucous membranes were not affected in the slightest degree, and there was absolutely no salivation. On the second day the papulous syphiloderm seemed submerged under this violent erythematous seizure; but, more remarkable yet, on the fourth day it vanished as if by enchantment. Such rapid cures are occasionally effected by inoculation of erysipelas, but rarely by four days of mercurial inunction. The fever and erythema subsided in five days, followed by desquamation of the epidermis. Mauriac regards this cure as effected, not so much by the mercury acting upon the syphilitic process directly, as by the fever produced by the mercury. Nor does he think that the cutaneous irritation had much to do with effecting a cure; otherwise, we would find cures effected by the application of croton-oil, or other irritant. Morel-Lavallée has reported a case of mercurial fever and erythema, which endangered life not only by the lesions of the skin, but also by visceral and cerebral hyperæmia. It may be assumed, therefore, that an acute, general, mercurial erythema, with febrile reaction, is sometimes a very favorable event in the treatment of syphilides; under the double action of the fever, and, perhaps, the erythema, the cutaneous relapses of syphilis disappear with an unexampled rapidity, which cannot be equalled by general or local specific treatment. However, the cure is, unhappily, but short lived.

The following ointment of calomel is employed by Bovero[507 No.1] as an inunction :—

Calomel,	15 grains (1 gramme).
Lanolin,	45 grains (3 grammes).
Cacao-butter,	15 grains (1 gramme).—M.

This amount, every five or eight days, is rubbed into the skin for twenty or twenty-five minutes. About 7 inunctions suffice for the disappearance of secondary symptoms. After a respite of two or three weeks he gives potassium iodide, and alternates the iodide with the inunctions during the first year, and, according to necessity, during the second.

Internal Treatment.—Three cases reported by Ozenne [24 Nov.29,'91] are instructive in so far as they show that rapid and perfect resolution is not always attained by the use of a mixed treatment in cases of syphilitic gumma. The first case was that of an unrecognized, ulcerating gumma of the labium major, existing for nine months. After a mixed treatment with biniodide of mercury and potassium iodide internally, and local applications of Labarraque's solution, the ulceration healed, but the enlargement of the parts continued uninfluenced. The second case was one of periarticular gumma and slight hydrarthrosis of the elbow, existing for five weeks. Mixed treatment relieved the local swelling, but left the forearm and upper arm atrophied. The third case, illustrating his failure to obtain complete resolution, was one of considerable perisynovial, gummatous infiltration and slight hydrarthrosis of the right knee, dating back several weeks. While suffering from these symptoms the patient had fallen down-stairs and sustained a sprain of the knee. A hard tumor was appreciable under the patella, free from the femoral condyles, but encircling the tendon of the triceps femoris; the whole limb was markedly atrophied, and movements of the joint were practically impossible. Under mercury and iodides there was some amelioration, but a nodule persisted under the patella, and resisted all treatment. The syphilitic nature of all three cases was established beyond a doubt. In conclusion, Ozenne remarks that articular and periarticular syphilis has a rapid and often an enduring effect upon the nutrition and function of the muscles belonging to the joint affected.

Upon the theory that the iodides of sodium and ammonium, being much more soluble than the iodide of potassium, will be first eliminated by the kidney and occasion a detention of the last-named salt within the system, G. Darzens [121 Sept.] believes that he has found a method of enhancing its efficacy. He has lately treated a number of cases in this manner, and relates the history of one case with some detail. The patient had specific ozæna, and was suffering night and day with intense headaches. Seventy-five grains (486 grammes) of potassium iodide daily had failed to give relief. The prescription was approximately as follows, the quantities being slightly changed in the conversion from the metric system to our apothecaries' measures:—

℞ Ammonii iodidi,
Potassii iodidi,
Sodii iodidi, ... āā ℥ss (15.55 grammes).
Hydrargyri iodidi rubri, . . . gr. ¾ (0.05 gramme).
Aquæ, ... ℥ixss (285.00 grammes).—M.

The result was satisfactory.

C. W. Allen [245 Feb.] states that the objections to the use of the more commonly employed mercurials—such as calomel, corrosive sublimate, the proto- and the bin- iodide—are sufficiently strong to warrant the search for a better preparation. Lustgarten was rewarded in such a search by discovering the hydrargyrum oxydulatum tannicum, or tannate of mercury, while working in the laboratory of Ludwig, in Vienna. The tannate is described as a dark, yellowish-green powder, without taste or smell, and insoluble so long as it is not decomposed. Its simplest mode of preparation consists in precipitating a solution of nitrate of mercury by a solution of tannate of soda in slight excess. Allen said that his experience with the tannate in the treatment of syphilis had been rather limited, extending to probably less than fifty cases. He has come to regard it, however, as an exceedingly efficacious preparation, showing its beneficial action on syphilitic products, often in a remarkably prompt manner. As to the mode of administration, the tannate may be given in pure state, as a powder alone, or mixed with sugar or licorice-powder, or combined with a few grains of tannin. For children it can be given in milk. It can be given in ½-grain (0.032 gramme) doses, three or four times a day, or as often as the symptoms require it, up to the point of toleration. In conclusion, Allen stated that the tannate seemed to possess the following advantages over the prevalent mercurial preparations for internal use: 1. It is stable; it does not decompose, dissolve, or change readily. 2. It is quickly assimilated. 3. A relatively large quantity of mercury can be given with safety, and a relatively large proportion is absorbed, as shown by quantitative analysis of the urine. 4. It is not so prone to cause salivation as calomel and the protiodide. 5. It is not so likely to cause diarrhœa and gastro-enteritis as the bichloride and protiodide. 6. It is well tolerated by children (doses ⅓ to ⅔ grain—0.022 to 0.044 gramme). 7. Being unchanged in the stomach, and only decom-

posed after it enters the alkaline contents of the small intestine, the stomach escapes any possible irritation. Lustgarten states that the drug passes through the normal stomach without change, but in the duodenum, where the reaction is alkaline, it is reduced to small globules of metallic mercury, so that it can be readily absorbed,—a process which he ventured to call "internal inunction." He prescribes it in daily doses of 3 grains (0.19 gramme), and, if this is well borne, it can be increased to 5 grains (0.32 gramme), or even more. One course of treatment consists of 100 to 150 grains (6.48 to 9.72 grammes). He has never observed any bad effect on the stomach by its use. In a few cases it may produce a mild diarrhœa. Certain dietetic rules should be observed by the patient, such as the non-indulgence in beer, white-wine, etc. He has never seen a case of stomatitis follow its use. He considers it especially valuable in the treatment of syphilis in children,—both in the hereditary and other forms. Morrow and Taylor stated, in the discussion which followed, that they had employed the tannate with good results.

Fournier $^{3}_{\text{Dec.16,'91}}$ thinks that mercury is by no means a cause of tabes dorsalis in syphilis. In an observation of three hundred and twenty-one cases of locomotor ataxia in syphilitics, he noted twenty-four who had become ataxic without having taken mercury in any form; and the number of syphilitics ending up with tabes declined in proportion to the length of the mercurial treatment. The frequency of tabes in syphilis he ascribes to nervous tendencies in the patients, and, therefore, absolute physical and mental rest should be enjoined as part of the treatment of neurotic patients.

Lang $^{16}_{\text{Jan.}}$; $^{2}_{\text{Jan.30}}$ states that not only affections of the mouth, but colitis and nephritis, may be among the early signs of acute mercurialism. Examination of the urine should be made from time to time. Nephritis may occur in the earliest period of syphilis, either as a direct action of the syphilitic contagion itself or of its products, namely, an infective or a toxic nephritis. It may be difficult to know whether a renal affection be syphilitic or not. If an individual previously presenting no evidence of renal disease contracts syphilis, and with the development of the constitutional ailment shows signs of nephritis, this may rightly be taken, in the absence of other sufficient cause, as part of the general disease. Albuminuria, with dirty-looking, bloody urine, blood-casts, and

cell-detritus, suddenly coming and quickly going, may point to a breaking-down gumma. If albumen and casts appear in the urine during, or shortly after, a course of mercury, the idea of a mercurial toxic nephritis suggests itself. The probability is greater if the symptoms first appear during the treatment. Mercury may be found in the urine. If the treatment be stopped, the symptoms disappear. The author then advocates the employment of oleum cinereum, by injection, in the treatment of syphilis, and shows that there is no danger in its rational use.

Peterson [17 Apr.5; 147 July] has made over 3000 analyses of the urine of 200 syphilitics. His conclusions are as follow: 1. It is necessary to examine the urine of all syphilitic patients on their admission to hospitals or clinics. 2. It is important to ascertain whether the albuminuria is false or true. 3. Albuminuria occurs in the first and second stages of syphilis in the proportion of 3.8 per cent., and 5.8 per cent. in tardy syphilis. 4. In treating syphilis by the salicylate of mercury, albuminuria is very rarely observed; yet it is unjust to hold that mercury causes albuminuria, as maintained by Guntz. It is probable that the friction of mercurial inunctions may have some causative influence. 5. The elimination of mercury by the kidneys does not produce albuminuria. 6. Syphilitic albuminuria disappears under mercurial treatment.

Local Treatment.—Augagneur [109 Aug.] holds that the local treatment of syphilis is of special importance in pregnancy. Free antiseptic disinfection must be used at first,—sublimate, boric acid, etc.; but care must be taken not to apply solutions too freely or too long. The humidity of the parts in pregnancy may cause accident. Hypertrophic lesions of the vulva must be carefully treated. Thus, condylomata must be freely and frequently dusted with boracic-acid powder, all fissures and folds being filled. The best powder to keep the growths thoroughly dry, and thus to cause their atrophy, is made of 10 parts of boracic acid to 20 of powdered talc. This compound is almost impalpable, non-irritant, antiseptic, and very adherent. Without careful treatment, condylomata grow quickly in pregnancy, and may cause grave complications.

P. A. Burtzeff [109 Sept.] has used dermatol in seventy cases of soft and hard chancres and incised indolent buboes, all in men. The subgallate was used either in powder, twice a day, in cases of very flabby and deep ulcers, or in the form of a 10- or 15- per-cent.

vaselin ointment. In the case of shallow ulcers and recently-incised buboes the discharge diminished, and in some cases entirely disappeared, on the second or third day, while the surface rapidly became covered with healthy granulations and very quickly cicatrized. Indolent or excavated ulcers healed somewhat less readily. The advantages of this bismuth salt are said to be as follow: (1) it induces far more rapid cicatrization than iodol or naphthalin; (2) it never irritates the surrounding skin; (3) it is quite free from unpleasant smell or toxic effects; (4) it is relatively cheap. The author also tried dermatol as a urethral injection in the form of a "suspension," in cases of gonorrhœa, but found it quite useless. The use of dermatol in soft chancres was tested and found to be useless by S. F. Kracht and Tchernogüboff, $\frac{530}{\text{No.1;}}$ $\frac{2}{\text{Apr.16}}$ who made a series of clinical experiments on twelve patients, in order to elucidate the comparative effects of dermatol and iodoform. The authors induced soft chancres on either arm of a patient by the inoculation of the chancroid virus, and afterward powdered the ulcers on one side with iodoform and on the other with dermatol. They came to the conclusion that dermatol is useless as a remedy for soft chancres. Bovero $\frac{589}{\text{Apr.20}}$ reports numerous rapid cures of balano-posthitis and syphiloma with dermatol.

Guntz $\frac{383}{\text{Jan.23;}}$ $\frac{1}{\text{Apr.23}}$ recommends aristol in venereal ulcers as a substitute for iodoform. It should not be in the form of an ointment, but should be applied directly to the wound. It is insoluble in water, but forms a tough, brown pap with olive-oil, which, however, is difficult of application. The undissolved powder itself is inert, therefore the ulcer should be covered with the powder, and a drop of olive-oil be allowed to fall slowly from a glass rod upon it. Without waiting for the solution to be effected, the ulcer is promptly covered with some fine impermeable tissue, under which the solution takes place slowly. No cotton or charpie should be applied. If the secretions are very profuse, or if the ulcer is in an unfavorable location, this dressing must be secured by means of court-plaster. The application should be renewed twice daily, after careful removal of that previously applied. Its advantages are that it is painless, odorless, and non-irritating, and that there are no inconveniences attending its use. Painful ulcers become painless, and previously bedridden patients become able to go about. If, however (as is the case in corroding or torpid ulcers), the heal-

ing tendency is not sufficiently rapid, recourse to iodoform must be had. It is of especial value in secondary lesions, in ulcerating gummata, in tubercular syphilides, etc.

I. I. Dotchevsky [586 No.23] warmly recommends the following simple, convenient, cheap, and strikingly efficacious method of treatment of obstinate and inveterate syphilitic ulcers of the leg:—

℞ Acidi carbolici, ... 6.00 grammes (℥iss).
Hydrargyri sublimati corrosivi, . . 0.13 gramme (gr. ij).
Aquæ destillatæ, ... 300.00 grammes (℥x).—M.
M. Sig.: Use to wash out the parts thoroughly.

Then the surface is carefully dried with absorbent cotton-wool, and afterward tightly covered with a piece of mercurial plaster. In the beginning of the treatment, the procedure should be repeated once daily; later on, every two days, and ultimately every three or four days. The patient may remain out and about during the treatment. As a rule, on the second day, the edges of the ulcer are found to be considerably congested. In a few days the surface becomes studded with bright-red and succulent granulation. Small-sized ulcers soundly heal in a fortnight; large ones, in a month or six weeks. It is necessary, however, that the plaster layer should be sufficiently thick (about the tenth of an inch), and three or four times as large as the ulcer. If the discharge be profuse, the surface should be slightly powdered with iodoform just before the application of the plaster. The mercurial plaster used by the author is the emplastrum hydrargyri vel mercuriale, Ph. Ross., which contains 20 per cent. of metallic mercury, with the addition of turpentine, colophony, etc.

Tschernomordik [530 p.79,'91] recommends caustic lead as an excellent remedy for quickly destroying acuminated condylomata. The following formula should be used:—

℞ Plumbi oxidi, ... 0.25 gramme (4 grains).
Liq. potassæ caust. (33 per cent.),. 7.25 grammes (2 drachms).—M.

As a rule, a single application proves sufficient for the complete destruction of the warts down to their base. In some rare cases, however, the application must be repeated twice or thrice, at intervals of two or three days. The remaining raw surface should be dusted with powdered iodoform. A cicatrix is formed in three to ten days.

Vaczi [392 p.54,'91; 673 Apr.] recommends the following mixture as a complete deodorant of iodoform. The odor of creolin is only perceptible at very close quarters, and the creolin itself causes no local irritation: iodoform, 2 parts; creolin, 1 part; vaselin, 25 parts.

Excision of the Chancre.—Renault [287 No.1] opines that there exists no single trustworthy proof of the value of excision of the initial sclerosis. The apparently positive results need positive proof of the diagnosis. So long as we do not know the micro-organism of syphilis, nor how long it remains localized at the seat of primary infection before spreading through the system, we have not the necessary criterion for the need, or possibility, of such an operation. In spite of the possibility of a rapid local healing, Renault thinks the uncertainty would be worse for the patient after the excision of a doubtful chancre, than if a positive diagnosis were reached by the ordinary expectant method. [In an article on syphilitic immunity (see page 45), Hudelo expresses the opinion that our present experience warrants excision.]

Another case of prompt excision of the primary lesion, followed by secondary manifestations, is related at length by Critzman, [164 Dec.24,'91] who, nevertheless, thinks that it is good practice to excise the sore, and thus obviate the possibility of its spreading infection to other people before it heals under conservative treatment. E. Ehlers, of Copenhagen, [2098 '91] gives a review of the whole question, and reports thirty-seven new cases treated by Haslund and Pontoppidon. The author is in favor of the method of extirpating the primary ulcer, though it very seldom prevents the outbreak of syphilis. In two new cases reported by him, the patients did not have any general symptoms, and both became re-infected with syphilis,—the one in one year, the other two years afterward.

For the treatment of chancres under a phimosis, Cordier [211 Apr.24] has obtained the best results with subpreputial injections of a saturated solution of chloride of zinc just previous to circumcision. The preputial cavity is first washed out with boric acid, the chloride of zinc injected, and allowed to remain one or two minutes; the cavity is again washed out with boric acid, and circumcision performed at once. The chloride of zinc has the inconvenience of causing considerable hæmorrhage during the operation. The wound usually unites by primary intention, even at the very border of the chancre.

Extirpation of Inguinal Glands.—Lauenstein $^{34}_{\text{July 12}}$ gives the observations on 182 cases of inguinal bubo treated by him,—53 with simple incision and 129 with typical glandular extirpation in the groin; 38 per cent. (mostly traumatic) were not to be traced to genital origin; 33 per cent. accompanied ulcus molle; 10 per cent. ulcus durum, or syphilis; 8 per cent. were associated with gonorrhœa. Fever was most frequent in cases of genital origin, both before and after operation. To avoid infection, the arrest of the bleeding is of the greatest importance, and attempts to gain primary union of the wound give poor results. In the 129 cases of typical glandular extirpation Lauenstein had no fatality, but one occurred, however, in his private practice, where, in an old man, pyæmia ensued after a wound of the crural vein. Stitching of the vein was at once practiced where the vein was wounded; œdema of the leg followed, and subsequently varices and an ulcer from thrombosis of the vein. In two cases of serpiginous chancre, recurrences of the bubo followed. At first the treatment lasted from sixty-two to ninety-nine days, but in later years, under thorough asepsis, it has been reduced to about forty-seven days.

Vidal $^{3}_{\text{Apr. 30}}$ recalls how Leloir, in a case of association of syphilitic and tubercular lesions, could make parts of a lesion disappear under specific treatment, and then demonstrate, by inoculation, the tubercular nature of the remainder.

Hartley's $^{1}_{\text{Aug. 27}}$ experiments in skin-grafting in the different stages of syphilis show that the disease must have practically run its course before skin-grafting would succeed.

CHANCROID.

About three years ago A. Ducrey $^{589}_{\text{'89}}$ described a microbe that he had found in soft chancres, and that he regarded as the cause of that disease. He inoculated, with antiseptic precaution, pus from soft chancres in a series of five or six subjects. While the sores resulting from the first inoculations contained numerous microbes, he did not find more than a single one in the last. The bacillus was short and thick, having rounded extremities, often with a lateral groove, and was either isolated or in chains. He was not able to cultivate it in any of the media employed in the laboratories.

Pusey $^{287}_{\text{June}}$; $^{1}_{\text{Aug. 20}}$ reports the discovery by Unna of a bacillus that

seems to be the pathogenic agent of the soft chancre. It occurs in the form of chains of two or more bacilli, and is most numerous in ulcerated tissue, though it is found between the cells of the surrounding tissue. It may be isolated in microscopical preparations by staining with methylene blue, and then decolorizing with styrone or ether and diluted glycerin. This is the only bacillus encountered, and Unna has found it in every soft chancre excised and examined by him. It is found in the tissue alone, unassociated with other microbes, being distributed in a peculiar manner, and it is not found in simple ulcers or in initial indurated sores. Apparently no effort has been made by Unna to cultivate this organism, or to demonstrate its pathogenic character by inoculation. Ducrey's inoculation experiments were a repetition of the oft-repeated experiments of inoculating the pus of a soft chancre, and cannot be regarded as demonstrating the pathogenic character of the micro-organism found by him. Quinquaud has confirmed Unna's discovery, having found a bacillus present in prodigious numbers in the lymphatics and intercellular spaces. The question is well worth further investigation, if only to demonstrate that the micro-organism causing soft chancre is but a more virulent form of some well-known bacillus.

Kretling, $\frac{45}{\text{H.11}}$; $\frac{112}{\text{Oct.}}$ in an investigation of twenty-three cases of chancroid from which inoculations were made, found constantly in all true chancroidal inoculations a broad, short, thick bacillus, with rounded ends and often a depression in the middle showing a lighter stain. They occurred at times in groups of five or more around the nucleus, and at times one or two isolated in the protoplasm itself. Their numbers were proportionate to the virulence of the pus. The author sums up as follows:—

1. Buboes caused by chancroids are either simple, non-virulent (the most common), or virulent. (One patient had both forms). 2. It is wrong to assume that a non-virulent bubo can at any time of itself become virulent. 3. The treatment of non-virulent buboes with repeated puncture and compression bandages causes them to disappear quickly.

Jullien $\frac{3}{\text{Apr.23}}$; $\frac{24}{\text{July 10}}$ found that the chancroid could be inoculated on the person bearing the original lesion up to the third generation of the micro-organisms, but not afterward. He inoculated on the arm with the pus from the original chancroid, and, with the

pus from the second sore, could again produce a chancroid; but the series of inoculations stopped always at the third generation. These observations concur with those made by Straus, but are directly opposed to the assertions of many observers, that the chancroid may be indefinitely inoculated. Jullien defers any conclusion on this subject until he has carried his experiments much farther. One noteworthy observation which he makes is, that in the pus from the second chancroid he could not discover a single micro-organism; nevertheless, this same pus was virulent and capable of producing at least one new inoculation. He argues from this that the bacillus of chancroid is possibly virulent only when associated with other bacilli,—in short, a symbiosis; and that, when it is isolated and by asepsis protected from the intermingling of other micro-organisms, its virulence is lost. [Greenough, of Boston, long ago called attention to the increasing rarity and decreasing virulence of chancroids, and suggested that, as each sore of that character might be considered the outcome of a long series of precedent inoculations, it might be that attenuation of the virus was taking place.—J. W. W.]

An interesting case of intra-urethral chancroid is reported by Ohmann-Dumesnil, $\frac{786}{\text{Dec.,'91}}$ who has classified these lesions as follows: (1) chancroid of the meatus, not infrequent; (2) urethral chancroid, an extension of the first into the urethra; (3) intra-urethral, very rare, some distance from the meatus, not connected with any similar external lesion, affecting the opposite walls of the urethra, and giving symptoms similar to gonorrhœa. The case he described was briefly as follows: A young married man suffered from eight chancroids of the prepuce and glans, bilateral enlargement of the inguinal glands, intense ardor-urinæ, and some purulent discharge from the urethra. White's urethral speculum was introduced, and, about three-eighths of an inch posterior to a point corresponding to the corona of the glans, there could clearly be seen two sharply-defined, circumscribed, oval lesions, covered with pus, situated directly opposite each other. The mucous membrane anterior and posterior to these lesions was apparently normal. The manner of infection is puzzling, no instruments having been used except a syringe, which the patient employed to inject a prophylactic fluid into his urethra. This case teaches the lesson that a purulent urethral discharge is not

necessarily gonorrhœal, and it also emphasizes the importance of urethroscopy.

Treatment.—The first indication in the treatment of chancroid, writes Balzer, [17 Sept.13] consists in destroying the ulceration, which is the veritable focus of infection, exuding a very contagious, auto-inoculable pus, and perhaps the point of departure of secondary lymphatic infections. The process rarely extends deeply into the tissues; hence it is possible to destroy, by means of powerful caustics and coagulants, both the contagium and the infecting focus. When the surface of ulceration is not extensive and the situation is convenient, excision may be a possible means. The actual cautery is also frequently of service, but not as general in its application as chemical caustics. Balzer found the following paste of chloride of zinc the best of the chemical cauterants: chloride of zinc, 1 part; oxide of zinc, 9 or 10 parts; distilled water, sufficient quantity. To be applied directly or by absorbent cotton soaked in it, and held on the surface of the chancroid. It should be left on twenty-four hours, and one application will often suffice. It causes slight pain, but is unattended with any danger of too violent action. Chloride of zinc is also the best caustic to be used in solution for single applications. Nitrate of silver is still recommended by Fournier, but always in weak solution—3- or 5-per-cent. strength—to avoid an irritation of the neighboring skin and consequent spread of the ulcer. Carbolic acid is also to be recommended.

Iodoform stands pre-eminent as the best permanent dressing in the intervals between applications of caustics. In brief, the best treatment is as follows: 1. Absolute cleanliness, asepsis of the neighborhood of the infective focus, and, to this end, hot local baths (temperature, 104° F.—40° C.) daily. 2. After the local bath, application of caustic, chloride of zinc, nitrate of silver, carbolic acid, etc., etc., as often as necessary until the ulceration becomes a simple wound. 3. When this is achieved, permanent dressings with feeble antiseptics, liquids or powders, until the sore is completely healed. Besides this, rest and tonics are necessary.

In Marseilles, where venereal diseases are on the increase, Lop [46 Mar.15] observes a noteworthy predominance of chancroids; the number in proportion to the true chancre is threefold, whereas in Paris a chancroid has become, in the last decade, almost a rarity.

In the way of treatment, camphorated phenol has given most satisfaction; it modified very successfully and very rapidly the evolution of phagedenism. Under the influence of two daily applications, very extended chancres have lost their virulence and healed in three or four days. Shasmintzew reports [571 Mar.24; 673 Apr.] several cases in which good results followed scraping of the ulcer and the subsequent application of a powder containing tannic and boric acids, or of a 2-per-cent. solution of nitrate of silver. He believes, as a result of these experiences, that grattage of chancroids—local anæsthesia having been previously effected—gives better results, as regards the rapidity of the cure, than any other method hitherto employed. When this is done early enough it is almost certain, he holds, to prevent the formation of a bubo.

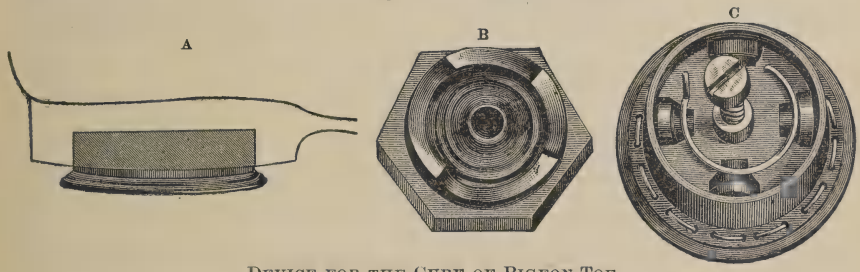
To abort buboes following chancroids, Welander, of Stockholm, [45 Nos.1,3,'91; 673 Apr.] recommends early injections of the benzoate of mercury in a 1-per-cent. solution, with $\frac{1}{2}$ per cent. of the chloride of sodium. Wash the skin first with sublimate solution; inject at one or two points $7\frac{1}{2}$ minims (0.48 gramme) of mercurial liquid; cover with sublimate wool; put on a pressure-bandage, and change twice a day. Rest in bed, if possible. The infiltration, as a rule, diminishes in a few days. Considerable fluctuation may develop, but it also soon disappears. The results of this treatment are very favorable. Out of the first 32 cases reported, tending to suppuration, this event was prevented in 30. In all, the author has treated 100 buboes in this way, with thoroughly satisfactory results in 78.

ORTHOPÆDIC SURGERY.

By LEWIS A. SAYRE, M.D.,
AND
REGINALD H. SAYRE, M.D.,
NEW YORK.

CLUB-FOOT.

Lyonnet, of Lyons, $\frac{211}{\text{June 12}}$ showed, before the Lyons Surgical Society, a case of marked double varo-equinus, which had previously been operated on by another surgeon by Phelps's method, and relapsed. Vincent had then done tarsothripsy by means of Robin's osteoclast, smashing the foot and fracturing the leg above the malleoli. The case had been put up in plaster of Paris, and made a good cure, the child walking well when shown.



Device for the Cure of Pigeon-Toe.
A, heel-swivel for pigeon-toe; B, shoe portion; C, heel-piece.
(*International Medical Magazine.*)

Hopkins, of Philadelphia, $\frac{451}{\text{July}}$ has devised an apparatus for the cure of pigeon-toe, which he has used for over two years. In the heel of the shoe is placed a steel box containing four inclined planes, while in the heel proper is fitted a second steel box containing four pulleys and a steel spring. When the heel is planted upon the ground the weight of the body causes the concentrically-arranged wheels each to run down its appropriate inclined plane, the foot is forcibly thrown out, and when it is again lifted the spring causes the heel-piece to recover its original position.

TENDON-GRAFTING.

M. L. Harris, of Chicago, $\frac{53}{\text{June } 25}$ describes a method of uniting divided tendons. He uses silk in preference to catgut, regarding the latter as too stiff and too apt to tear a small tendon. His method of suturing the tendons is as follows: An ordinary round sewing-needle, so as not to cut the tendon-fibres, is threaded with sterilized silk as fine as the requisite strength will permit. The ends of the tendon are cut square and the needle made to enter the end at its centre, from before backward, and a little to one side of the centre laterally. Passing longitudinally up within the tendon, it emerges on the surface from three-eighths to one-half an inch from the end, and on one side of the mid-line. Crossing to the other side of the surface, the needle re-enters the tendon, passes longitudinally down within it, and again emerges on the end at a point opposite to its first point of entrance. It is then passed through the other end of the tendon in exactly the same manner.

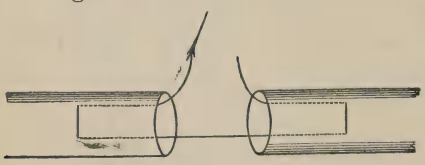


Fig. 1.

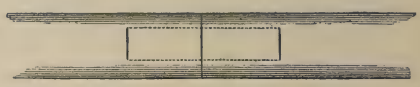


Fig. 2.

Method of Suturing Tendons.
(*Cincinnati Lancet-Clinic.*)

The stitch will be readily understood by a glance at Fig. 1. It is then drawn tight, until the ends of the tendon are in accurate apposition, tied, cut short, and the knot buried between the ends of the tendon, as in Fig. 2. The advantages claimed for this stitch are, that it will stand considerable traction, as it draws transversely on the tough tendon-fibres; the ends of the tendon are "threaded" in accurate apposition, and cannot become displaced; the knot is buried, leaving the surface of the tendon smooth, so as not to acquire adhesions to its surroundings.

He lays great stress on the interposition of a layer of sound tissue between the skin suture and that of the tendon-sheath, and so makes the skin incision to one side of the tendon instead of directly over it, in order that the cicatrices will not be common to both structures.

It may happen, occasionally, from the loss of a portion of a tendon, that the ends cannot be brought in contact. When

the interval left is not great, a silk suture may be introduced in the manner above described, approximating the ends as closely as possible, and tied. The sheath or deep fascia is carefully stitched over it and the wound closed. Connective tissue will be produced along the suture, ultimately connecting the ends of the tendon. This procedure is practicable where the interval does not exceed an inch. When the interval is greater than this, or where, for instance, a stubborn patient refuses to take an anæsthetic or permit the enlarging of the wound, so as to find the retracted end and draw it down, the lower end may be attached to some adjoining tendon of a similar function; or a tendon of a subordinate function may be severed and made to take the place of the wounded one. When it is to be attached to an adjoining tendon, the sheath of the neighbor should be opened and a small longitudinal slit made in it to receive the end of the divided tendon. The suture is passed through the cut end, as above described,

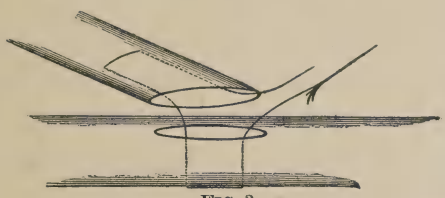


FIG. 3.
METHOD OF SUTURING TENDONS.
(*Cincinnati Lancet-Clinic.*)

and then through the adjoining tendon from the bottom of the slit. Crossing over, so as to include some of the fibres transversely, the needle again transfixes the tendon, appearing at the bottom of the slit, when the suture is drawn tight and tied, fixing the end closely and accurately into the slit (Fig. 3). The sheath and deep fascia are then attended to as above.

During the definitive healing of a sutured tendon, there is formed a sort of callus around the ends, as was pointed out by Koenig, and during the life of this callus the tendon is adherent to the sheath at that point. This callus, however, is absorbed in about four weeks, when the tendon will again slide loosely within the sheath.

This indicates that perfect motion should not be expected too soon, nor should too powerful active and passive motions be instituted until the callus shall have had time to become absorbed.

B. F. Parrish, of New York, $\frac{1}{Oct.8}$ describes a new operation for paralytic talipes valgus. He was forcibly struck by the number of cases in which the extensor proprius pollicis was unaffected, and his observations show that in not more than 2 or 3 per cent. of the cases, where the anterior tibial is paralyzed, is the extensor proprius pollicis also involved. In cases where the anterior tibial was completely paralyzed, or so near so that it could not perform its function, after careful and prolonged treatment by electricity, massage, etc., the idea occurred to him that the strong extensor pollicis might be able to bear part or all the burden of its weaker neighbor.

On May 15, 1892, the first operation was done. The patient, aged 3 years and 10 months, had had infantile paralysis, when 11 months old. At the time of operation, both tibial muscles of the right leg were completely paralyzed, giving rise to talipes valgus. All the other muscles which had been involved had recovered. The foot could easily be put in the correct position. The extensor pollicis was moderately strong.

Under chloroform anæsthesia, an incision was made over the space between the tendons of the anterior tibial and extensor pollicis muscles, extending from the annular ligament three inches or three inches and a half upward. Both the tendons were found and isolated. The tendon-sheaths were cut away, and the foot was inverted and extended so as to shorten up the tendon of the anterior tibial and pull down the tendon of the extensor pollicis. The opposing tendon surfaces were then freshened with the knife and sewed together with a catgut suture for a space of an inch or more, and the wound was closed. The foot was then molded into the proper position and retained there by a plaster-of-Paris bandage, which was worn for a month. When the dressings were removed the wound was found perfectly healed, and the foot in a much better position than before the operation.

In some cases a better result may be obtained by cutting off the tendon of the extensor pollicis and sewing it on to the common extensor of the toes, and then cutting the anterior tibial tendon and uniting the proximal end of the extensor pollicis to the distal end of the anterior tibial, thereby allowing the extensor pollicis only the function of the anterior tibial muscle. In cases where the posterior tibial is also paralyzed, it may be necessary to sew its tendon fast to the tendo Achillis.

This patient was shown, at the December (1892) meeting of the Orthopædic Section of the Academy of Medicine, New York, having had this latter operation performed with the effect of improving the position of the foot very much, though sufficient time had not elapsed to establish the permanency of the improvement. At the same meeting, A. M. Phelps, of New York, showed a case in which, for the relief of paralytic calcaneus, he had divided the peronei behind the malleolus and attached the proximal end, and those of the flexor muscles of the toes, to the distal end of the divided tendo Achillis. The distal ends of the flexors and peronei were sewed fast to the periosteum. Tendon transplantation seems to have been first done by Nicoladoni, who performed a similar operation to that just reported, for the relief of paralytic calcaneus, according to Hoffa. $^{2101}_{p.157}$

Sporon $^{336}_{Sept.3}$ describes a method for lengthening contracted tendons. He makes two parallel longitudinal incisions in the tendon, each five centimetres long, one being one centimetre higher up on

METHOD OF LENGTHENING CONTRACTED TENDONS.
(*Centralblatt für Chirurgie.*)

the tendon than the other. The opposite ends of these incisions are then joined with a transverse cut through the tendon from its edge farthest away from the cut. This makes an S-shaped bit of tendon, which, on being straightened out, increases the length of the tendon an amount equal to the length of the slit. The illustration makes this proceeding clearer.

Glück, of Berlin, $^{41}_{Mar.10}$ presented, before the Berlin Medical Society, two cases in which he replaced defects of tendon by threads of silk and catgut joining the separated ends. One case had been operated on four years before for a loss of substance in the deep and superficial flexors of the middle finger, ten centimetres long. This was replaced by silk and catgut threads, and, when shown, the patient had perfect control of his fingers. The second case was a boy who had had an injury to the extensor of the index finger. Glück freshened the proximal end of the muscle, surrounded it with a little bundle of silk threads, and fastened them by a nail to the insertion of the tendon. The first operation was a failure.

The second one proved a success, the nail being removed at the end of four weeks, and after eight weeks, when shown before the society, the boy could extend both middle and end phalanges. It is ten years since Glück described this procedure, which was then treated with ridicule.

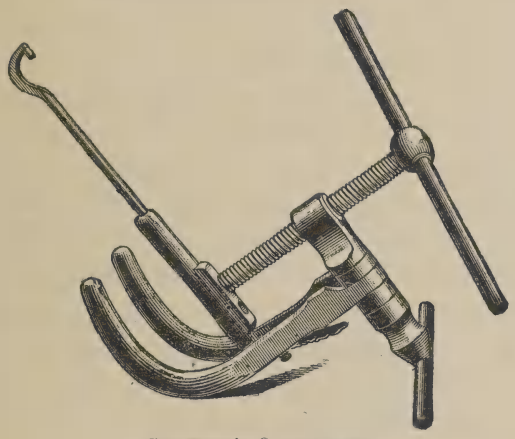
GENU VALGUM.

John Ewens $_{\text{Sept.21}}^{22}$ calls attention to the overgrowth of the inner tuberosity of the head of the tibia as a cause of a genu valgum, occasionally being the sole cause, though usually associated with and less marked than changes in the femur. Each condition he believes probably due to some accidental circumstance which induced increased blood-supply in one part rather than the other. In regard to operation, he prefers removal of a wedge or wedges of bone, which, he thinks, is less dangerous than making a number of sections of the bone.

Regnier, of Prague, $_{\text{B.43,H.2}}^{2\,6}$ discusses the various operations for the relief of genu valgum. The three principal ones are: wedge-shaped resection, linear osteotomy of the tibia, and the same of the femur. When tibial osteotomy is performed the fibula sometimes has to be cut or broken as well, on account of the resistance offered by it to reduction of the deformity. After operations on the fibula there is occasionally paralysis of the peroneal nerve from pressure, and operations below the knee require more careful after-treatment to prevent relapse than those done on the femur. The incision for dividing the fibula should not go more than one and one-half centimetres below the head of the bone, as there is danger of injuring the external popliteal nerve. At the clinic of Wölfler, where Regnier made his observations, immediate reduction of the deformity is not practiced, but the limb is put up in plaster of Paris, with hinges inserted at the break. At the end of eight or ten days the leg is gradually pulled around by an elastic band until it is straight. In this way it is claimed that a better result is secured than by immediate correction of the deformity, avoiding the danger of gliding by of the fragments and a "bayonet joint."

Grattan, of Cork, $_{\text{Nov.26,Dec.3}}^{19}$ reported one hundred and fifteen cases of osteoclasis for bow-legs, knock-knees, and intoeing after club-foot, done by his osteoclast with excellent result, and showed the

femur of a child on whom he had done the operation for genu valgum, and who had died some months after of an intercurrent disease. The bone was sharply bent just above the condyles, there was no callus, and but for the curve, and fact that the line of union was still perceptible, the bone seemed normal. The instrument consists of two curved bars, which can be approximated or separated as may be desired. These bars are connected together by means of a strong pivot, to one end of which is attached a cross-bar, for the purpose of preventing the instrument overturning when in use. Through the other end of the pivot the screw works, to the end of which is attached the handle. The other end of the screw is fitted into the pressure bar. The pressure bar is straight.



GRATTAN'S OSTEOCLAST.
(*Medical and Surgical Reporter.*)

The part through which pressure is applied to the limb is oval in shape, in order to prevent its cutting the skin. A long rod is inserted into the end of the pressure bar, to prevent its rotating on the limb when the screw is turned. The three bars are sufficiently long to prevent their *entering* and cutting the skin. The curved bars, which oppose the pressure bars, are cylindrical in shape. A rachet, the divisions of which, half an inch apart, regulate the distance between the curved bars, is placed underneath the pressure bar, the use of which is to prevent the curved bars from being forced together when the pressure is applied.

The three bars are not covered with rubber, but highly polished. The fracture should be as close to the joint as possible

in genu valgum. In operating on a femur for genu valgum, one curved bar of the osteoclast is placed on the outside of the femur, just above the condyle, the other from one and one-half to four and one-half inches higher up the limb, according to the age of the patient. The oval bar, in which the end of the screw works, is applied to the femur on its inner side, *transversely*, midway between the other bars. The three bars are held in position on the limb by an assistant, who must prevent the pressure bar from rotating by grasping the long bar, which is inserted into it. The assistant must also take care that the pressure bar does not compress the femoral vessel, and that *the skin* under the pressure bar is *quite loose ;* otherwise it will be more apt to tear.

All being ready, the operator turns the screw quickly and forcibly, until the bone is felt or heard to break. The screw is then rapidly reversed to relieve pressure. After the bone has been broken and the osteoclast removed, the operator takes the limb in his hands, feels that all the fibres of the bone have been torn across, and sets the ends together in their new position. Grattan usually employs a long splint, curved like a cask-stave, to retain the limb in its new position. He always *overcorrects* his cases of *knock-knee*, and invariably uses some method of extension, usually the weight and pulley. On the ninth or tenth day he examines his cases, and, if not sufficiently corrected, re-adjusts them into proper position. In cases of anterior curving of the tibia, the pressure bar is applied at the outside of the leg, not on the front of the shin. An anæsthetic is always used.

KNEE-JOINT.

Braatz $\frac{999}{B.4,H.1}$; $\frac{451}{Aug.}$ has a very interesting article on the treatment of contractures at the knee-joint, with portative apparatus. The principles on which the knee-joint of the author's splint is constructed have been known since the gliding motion of the tibia on the femur was described by the brothers Weber, in 1836, and by Hermann von Meyer, in 1853. The latter showed that the curve of the condyle of the femur, in the posterior half of the knee-joint, was 120° on a radius of 5, while in the front half of the joint the curve was 40° on a radius of 9 ; the tibia also having two axes around which it revolves, instead of one. (See Fig. 1, page 9.)

In spite of the well-known construction of the knee-joint, many splints designed to overcome flexion have been made on the hinge principle, and, therefore, as was shown many years ago, inflict injury on the joint in the efforts that are made to straighten it.

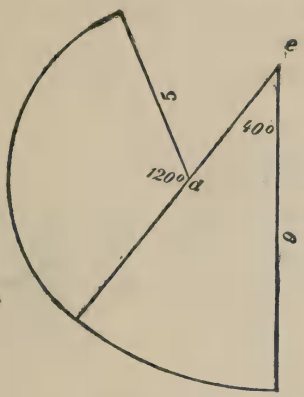


FIG. 1.—APPARATUS FOR TREATMENT OF CONTRACTURES OF KNEE-JOINT.
(*International Medical Magazine.*)

Braatz's instrument has a joint constructed to follow quite closely the theoretical outline of the condyle of the femur, but the axis is placed rather higher up than the lower axis of rotation in

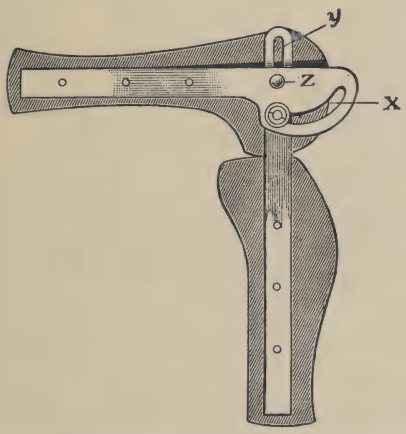


FIG. 2.—APPARATUS FOR TREATMENT OF CONTRACTURES OF KNEE-JOINT.
(*International Medical Magazine.*)

Meyer's sketch (*d*, Fig. 1), in order to make more traction on the joint when the tibia is extended on the femur. The lower end of the femoral part of the joint consists of a broad plate in which a slit (*x*, Fig. 2) is cut on the curve described by Meyer. A pin

(*z*, Fig. 2) is set in this plate, a few millimetres higher than the lower axis of Meyer should be placed. The tibial part of the joint consists of a flat strip, having a long slit (*y*, Fig. 2) running in its long axis, in which the axis-pin (*z*, Fig. 2) of the femoral part rests. A pin on the tibial part plays in the curved slit of the femoral piece, and thus, when the femoral part is firmly fastened to the thigh and the tibial part to the leg, and when the latter is

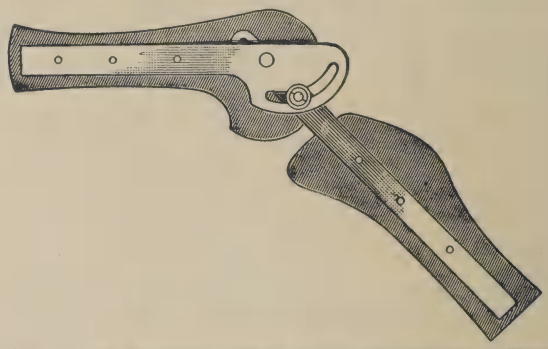


FIG. 3.—APPARATUS FOR TREATMENT OF CONTRACTURES OF KNEE-JOINT.
(*International Medical Magazine.*)

extended on the former, the head of the tibia is drawn away from the femur more and more as the leg approaches complete extension. (See Figs. 2, 3, and 4.)

The splint is fastened to the leg by an anklet going above the malleoli, which is lashed to a foot-plate, while counter-extension above is obtained by a ring passing under the tuberosity of the

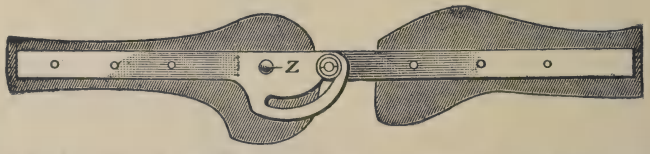


FIG. 4.—APPARATUS FOR TREATMENT OF CONTRACTURES OF KNEE-JOINT.
(*International Medical Magazine.*)

ischium, the whole being strapped around both leg and thigh to retain the splint in position.

CONGENITAL DISLOCATION OF THE HIP.

A. M. Phelps, of New York, [99 Jan. 28] reports a case of congenital dislocation of the hip, in which the head of the femur lay above the acetabulum and in front of it. The acetabulum was small,

angular, and undeveloped. There was no history of injury or difficult labor. He believes that the treatment of congenital dislocation of the hip should be divided into three stages: 1. The period in bed. 2. The period with the long fixation splint, with a lateral-pressure screw. (See Fig. 3, page 12.) 3. The period with the walking splint.

The length of the period of bed treatment should continue until the limb is drawn down to the length of its fellow, if possible.

FIG. 1. FIG. 2.

CONGENITAL DISLOCATION OF HIP.
(*Boston Medical and Surgical Journal.*)

During this treatment by extension the patient is put into steel breeches (see Fig. 4, page 12), which have a lateral-pressure screw fitted to a pad, which makes pressure over the great trochanter; the object being to excite a certain amount of irritation, which will result in the growth of new tissue around the head of the bone. After the limb has been drawn down to its normal length, which will take usually from two to six months, the patient is put on crutches, with a high shoe and fixation splint, with lateral pressure. The patient is never allowed, during this stage of treatment, to

step upon the brace, but, after a year or a year and a half, the upper part of the brace is cut off, the high shoe is lowered, and the patient allowed to walk upon the splint. Small children are treated with the plaster-of-Paris portable bed.

Gendron, of Bordeaux, $\frac{70}{\text{Apr. 11}}$ divides congenital dislocations of the hip into three distinct classes, as they are presented for treatment: (1) those in which there is merely an abnormal laxity of the joint, which permits the head of the femur to escape from the acetabulum by rupturing the capsule; (2) cases in which the normal relations of the joint no longer exist, the articular end of the femur having entirely escaped from the acetabulum, lying upon the dorsum ilii adjacent to the articular cavity; (3) a more pronounced set of cases, in which the head of the

Fig. 3.

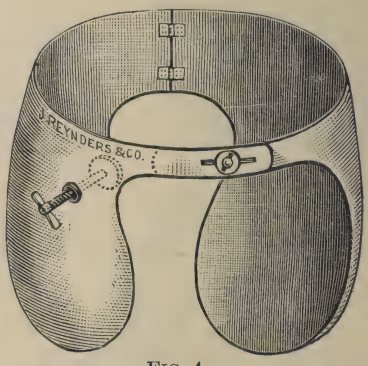


Fig. 4.

Apparatus for Correction of Dislocation of Hip.
(*Boston Medical and Surgical Journal.*)

bone lies at a considerable distance in the external iliac fossa, and is more or less immobilized in its new situation.

In treating the first two classes, the author uses a corset with firm pelvis belt, fenestrated over the trochanters, supplied with a screw-pad, which is capable of being moved so as to make pressure above the trochanter, whose position, in relation to the ilium, can be examined through the fenestrum. Extension bars, running down the leg and fastened to the feet, having joints at knee and ankle, serve to regulate the position of the femur. The apparatus

is applied in the horizontal position, while extension is made on the leg. (See Figs. 1, 2, 3, pages 13 and 14.)

Lorenz $\frac{336}{\text{Aug. 6}}$ reports six cases of congenital dislocation of the hip, which he has treated by modification of Hoffa's operation. He thinks the hamstring adductors are chiefly the cause of difficulty in drawing down the head of the femur, and that the muscles going from the pelvis to the trochanter are not much at fault.

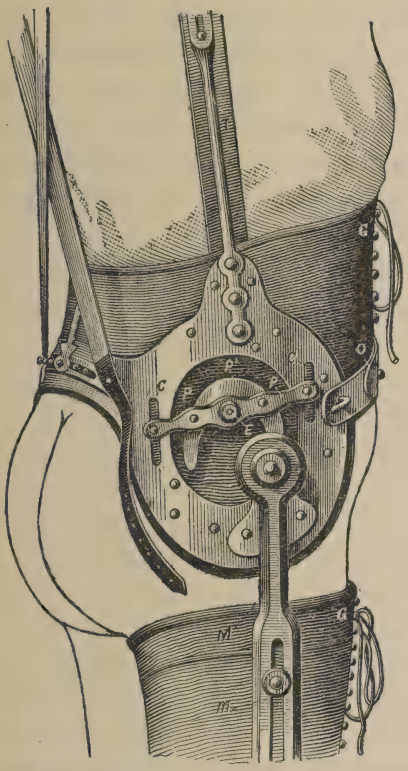


FIG. 1.—INSTRUMENT FOR TREATMENT OF CONGENITAL DISLOCATION OF HIP.

The following are the steps of the operation practiced by Lorenz: During forcible extension of the lower limb, and counter-extension, the adductors

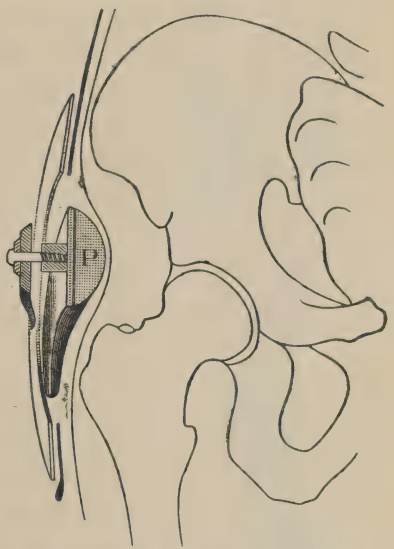


FIG. 2.—SCHEME REPRESENTING THE LOCATION OF PRESSURE.

(*Gazette hebd. des sciences méd. de Bordeaux.*)

are divided subcutaneously, and, through the same puncture in the skin, the stretched and prominent hamstring muscles are detached from the tuberosity of the ischium. Extension being still maintained, a skin incision, about three inches in length, is carried directly downward from the antero-superior spine of the ilium. The margins of this wound being separated, the deep fascia and the anterior borders of the tensor vaginæ and of the gluteus medius and sartorius are divided in a transverse

direction. After exposure of the rectus and division of its tendon close to the antero-inferior spine, the anterior portion of the capsular ligament is divided by a crucial incision. Extension of the limb is now discontinued, and the region of the acetabulum is rendered accessible by flexing, adducting, and thrusting the femur upward. It is necessary, at this stage, to detach some of the tense portions of the capsule from the anterior and inner surfaces of the neck of the bone. This should be done very carefully, with a blunt-pointed knife kept close against the bone. The acetabulum, or the region corresponding to this cavity, can now be readily attacked by a Hoffa bayonet passed along the fore-finger of the left hand, and may also, on forcible separation of the sides of the wound, be exposed to view. The acetabulum is now deepened, care being taken to spare the osseous elevation which forms its posterior and upper boundaries. Finally, the head of the femur is drawn down and placed in the deepened cavity. The edges of the wound, except in the middle, which is left open for drainage, are brought together by catgut sutures, and a plaster-of-Paris bandage is applied, with the femur slightly abducted.

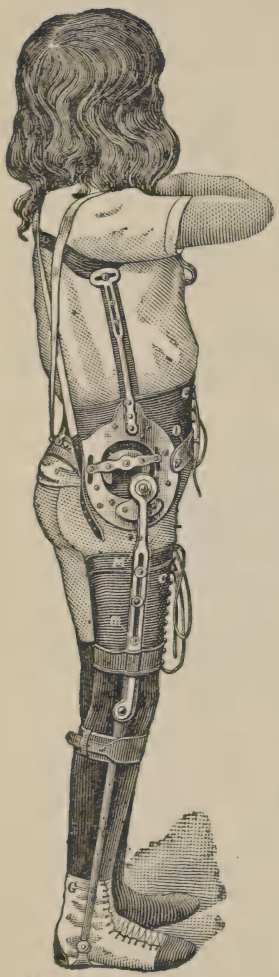


FIG. 3.—INSTRUMENT IN POSITION.
(Gazette hebd. des sciences méd. de Bordeaux.)

Karewski, of Berlin, [336 Sept.10] commenting on Lorenz's paper, says that, in February, 1889, he replaced the head of the femur in the acetabulum, through an anterior incision (Hüter's), this being, he claims, the first successful case of the kind on record. He has now operated on eight cases of paralytic luxation, all of which were infra-pubic. All had, after operation, freely movable joints, and none have suffered relapse. He has also operated on five congenital cases, and thinks the results are less apt to be good than in the paralytic variety. In

all five cases the head of the femur remained in its place at first, and the limb was decidedly lengthened, though never quite as long as its fellow. There was free movement in the joint. In two cases the orthopædic apparatus to keep the head of the femur in the acetabulum was removed too soon, and he fears these will ultimately be classed as failures, as the head of the bone is beginning to slip up. One other case did well, till death occurred from scarlet fever. The other two walk almost naturally. From eighteen months to two years has elapsed since operation. He has had one case following scarlet fever. This case wore apparatus for six months after operation, and walked well with high shoe, without limping. In the congenital cases he thinks König's method of deepening the acetabulum by periosteal flaps is an advantage, and as this requires the posterior incision he prefers the latter. The malformation, or even absence, of the acetabulum, in these cases, renders the operation more difficult in the pathological variety.

Lannelongue, of Paris, [321 Feb. 15] has applied his sclerogenic treatment of white swelling, by subcutaneous injections of chloride of zinc, to the treatment of congenital dislocation of the hip. Having found that the injection of chloride of zinc under the periosteum of rabbits causes a proliferation of bone, and acting on the anatomical fact that, in the majority of cases of congenital dislocation of the hip, there is not sufficient depth to the acetabulum to retain the head of the femur after it has been replaced, it occurred to him that, after replacing the head of the femur as nearly as possible in the acetabulum, the latter might be deepened by irritating the periosteum, along its upper and posterior edges, by injecting chloride of zinc, in this way building up a new bony wall, which would keep the head of the femur from slipping up on the dorsum of the ilium.

In the case of a child 3 months old, with congenital dislocation of the hip, he first drew the thigh down as far as possible, and then injected, along the upper border of the acetabulum, 20 drops of a 15-per-cent. solution of chloride of zinc, depositing two or three drops at each point and making a fresh skin puncture for each injection. There was no constitutional disturbance, and after ten days a slight swelling was noticeable, very hard and tending to limit the movement of the femur upward. Fifteen days later a second injection, similar to the first, was made into

this bony ridge formed by the previous treatment; this caused a bony ridge above the line of the acetabular edge, of sufficient thickness and hardness to prevent the head of the femur from slipping up. The leg was kept extended during treatment.

HIP-JOINT DISEASE.

Lovett and Morse, of Boston, [99 Aug.18] report a number of cases of hip disease which lasted a remarkably short time, though, when first seen, there was nothing to distinguish them from cases in which treatment had to be continued over years. Out of one hundred and fifty-six new cases applying for treatment, thirteen had made a rapid recovery and remained well. Eight of these seemed to have had a simple acute synovitis, but resembled true hip disease so closely that a diagnosis between the two was impossible, as in the following case: Frank B., 19 months old, was brought to the hospital in February, 1888. He had then been ill for six weeks, the last three in bed. The hip was very sensitive, and the slightest motion extremely painful. Night-cries were continual, and he had lost flesh rapidly. He had been treated for rheumatism for some time, but the diagnosis of hip disease was finally made by the family physician. Examination showed much tenderness about the hip, the thigh was held flexed at 45 degrees, there was no motion, and much trochanteric thickening. The diagnosis of hip disease was confirmed, and the child measured for a Cabot frame. He improved so rapidly, however, that he did not return, and was well in ten days. He had no abscesses, and has not been lame since. Now, four years later, perfectly well and strong.

In other cases there must have been an ostitis, the cases recovering with shortening, thickening about the trochanter, and, in some cases, slightly limited motion. These cases recovered in from two to eight months, some with and some without treatment, showing that the tubercular process, in the neighborhood of the hip-joint, may at times undergo reparative changes, when the child's nutrition favors such a condition, in a remarkably short space of time. The editors have seen a number of such cases in their own practice, but would warn against mistaking the remission, which often occurs after the first severe symptoms, for these transient cases, and to continue treatment till there is no doubt that the symptoms are definitely cured.

Brackett, of Boston, [99 Mar.31] has been investigating the condition of the patellar reflex in hip disease. He usually found an increase of the reflex on the affected side, as compared with the sound side, and, in proportion as there was irritability of the joint with muscular spasm, so was there an increased patellar reflex. In the differential diagnosis between hip disease and lumbar caries this symptom is of value, as in the latter disease the reflexes are much less apt to be exaggerated, and the reflexes on both sides are equal.

Heaton, of Birmingham, [32 June] reports a case of hip disease with abscesses, where, after exsection and scraping, pus continued to form. An incision was made in front of the thigh and to its inner side, a little below Poupart's ligament. In this a drainage-tube was inserted. The pus coming from this sinus always pulsated. A week afterward, while removing the dressings, the tube was found pushed out of the sinus and blood welling up from them. Large masses of blood-clog were in the bed. Pressure was made on the external iliac artery, and, under chloroform, an attempt to find the bleeding point was made; but not being readily found, and the patient being in a critical state, the external iliac artery was tied with carbolized catgut. The boy recovered from the operation, but six weeks after, being in a bad condition with many sinuses around the hip, amputation by the Furneaux-Jordan method was done by Jolly, the boy dying six hours later. The autopsy showed the hæmorrhage to have come from the internal circumflex artery, which had probably been eroded by the drainage-tube. Townsend, of New York, [853 Nov.] reported a similar accident in a case of psoas abscess, where the drainage-tube had been placed too near the artery. In this case the femoral artery was tied above and below the point of injury and the child recovered.

L. A. Sayre, of New York, [1 Apr.30] reports the results of treatment by the portable traction splint, without immobilization, except during the inflammatory stage of the disease. The histories included all the cases of which he had record between the years 1859 and 1889. The cases in which excision of the hip-joint was practiced have not been included, as they had already been published, and many of these were not in a condition to allow anything short of radical operations at the time when they were first seen.

Statistics of 407 Cases of Morbus Coxarius Treated between 1859 and 1889, Exclusive of Exsections.—Of these there were, in the first stage, 118; second stage, 119; third stage, 82; not mentioned, 88. Total number of cases, 407. *Results:* Cured, motion perfect, 71; cured, motion good, 142; cured, motion limited, 83; cured, ankylosed, 5; unknown, 78; under treatment, 14; abandoned treatment, 3; discharged, 2. Died of exhaustion, 2; died of phthisis, 1; died of pneumonia, 1; died of tubercular meningitis, 5. Total deaths, 9. Total number of cases, 407.

Cases in which Sayre Knows the Result and the Kind of Splint Worn, between 1859 and 1889, Excluding Cases under Treatment.—Cures with perfect motion: Long splint, 19, or 21.59 per cent.; short splint, 54, or 28.12 per cent. Total, 73. Cures with good motion: Long splint, 34, or 38.63 per cent.; short splint, 86, or 44.79 per cent. Total, 120. Cures with limited motion: Long splint, 29, or 32.95 per cent.; short splint, 49, or 25.52 per cent. Total, 78. Cures with ankylosis: Long splint, 3, or 3.40 per cent.; short splint, 1, or 0.52 per cent. Total, 4. Deaths: Long splint, 3, or 1.56 per cent.; short splint, 2, or 1.04 per cent. Total, 5. Treated with long splint, 88; treated with short splint, 192. Total number of cases, 280.

The histories of seven illustrative cases were read, in which the diagnosis had been confirmed by various prominent surgeons. In six the cure was perfect, as shown by the patients themselves, or by photographs, they being able to flex and extend the thigh perfectly, and also place the foot of the affected side on the sound knee while sitting, and, at the same time, put the shin parallel with the floor, showing that rotation was unimpaired. The seventh patient, who could flex and extend his leg so as to ride a bicycle, but not put his foot on his lap, was shown as a good cure in contrast to the perfect cases.

The mode of treatment had been rest in bed, with traction in the line of the deformity applied to the diseased leg, and, occasionally, traction in the axis of the neck of the femur, the sound side being bound to a long side-splint. Blisters were usually applied behind the trochanter major. When the deformity was reduced the patient was allowed to go about with the short traction splint and crutches, or the long traction splint with or without crutches, as the case might require. Cases in which both hips were involved

were treated in the wire cuirass. Traction was regarded as vital to proper success.

Bilton Pollard and Marshall, of London, $\frac{6}{July\ 30}$ report the results in 37 cases of excision of the hip-joint. In 10 of the 37 cases the disease was assigned to a fall or blow on the hip; in 1 case the disease appeared whilst a double Thomas splint was being worn on account of disease of the other hip. In the majority of cases the duration of disease before operation was between six months and two years; in 5 cases the duration was unknown.

In 29 cases the abscess was situated anteriorly to the great trochanter; in 15 of these it was altogether in front; in 14 it was partly anterior and partly to the outer side of the hip; in 3 cases the abscess was behind the great trochanter; in 1 case the situation is not recorded. Two cases had also an iliac abscess, which was found to communicate with the joint through the psoas bursa. Four cases had discharging sinuses before the operation; 3 of these were situated anteriorly and 1 posteriorly. The sinus leading from the superficial abscess to the joint was usually found just above the neck of the femur. The abscess had apparently burst from the joint, at the posterior part of the capsule, and had subsequently passed forward owing to the resistance being least in that direction. In 1 case the sinus passed directly backward to the joint through the Y-ligament.

In the large majority of cases—viz., 35—the head of the femur and the acetabulum were denuded of cartilage and the bone carious to a greater or less extent at the time of operation. In 5 cases the trochanter was also diseased; in 1 case the acetabulum only was affected; in 1 case the head of the femur was removed as a sequestrum.

In the large majority of cases the anterior operation was performed, posterior excision only being done in 4 cases. Of the 33 anterior operations, 2 were of the nature of an arthrectomy, viz.: (1) the case in which the acetabulum only was diseased, and (2) the case in which the head of the femur was removed as a sequestrum. In 5 cases an operation was performed previously to excision; in 3 of these the operation consisted in simply opening and draining the abscess; in the other 2 cases a partial arthrectomy was attempted.

Five cases died before the wounds healed. Of the remaining

32 cases, the wounds in 12 healed by primary union in three or four weeks, and in six more healed by primary union except at the tube-tract, which granulated in two or three weeks more without suppuration. This makes a total of 18 cases, or nearly 50 per cent. of all cases in which the wound practically healed by primary union. In the other 14 cases the period of primary healing was from three to fifteen months after excision.

In 26 of the 32 cases recurrence of disease took place; no recurrence took place in 6 cases up to the time when last seen (it must be mentioned that 1 of the 6 died of diphtheria in four weeks and a half after excision). In other words, about 81 per cent. recurred and about 19 per cent. did not recur. In the 26 cases which recurred, there was further bone disease in 12 cases, or 37.5 per cent. of the total number of cases (32).

Secondary operations were required in the 26 cases which recurred; but in 14 of them, in which no recurrence of bone disease took place, the operations were of a simple nature, as a rule, and caused but little further pain or trouble to the child. In only 1 case of the 37 did general infection (tuberculous meningitis) ensue after the operation. One patient developed phthisis soon after his hip was excised, but when last seen, some nine months after he had left off his splint, no signs of phthisis could be detected, and, though still thin, the boy had decidedly improved in general health. In no case did any sign of amyloid disease appear.

Four, or 10.8 per cent. of the cases, died soon after they had been operated upon. In two of the cases death was due to shock. The death of one child was most probably due to too hot water being used for irrigation. The water was very hot, but it was not too hot to be borne by the operator's finger, which was kept in the wound all the time the water was flowing. The pulse, which had previously been fairly good, failed at once, and, notwithstanding the most persevering efforts to counteract it, intense collapse supervened and the child died in three hours. This patient was the first on whom the writer used boiled-water flushing. In another case the operation was too prolonged, owing to the iliac abscess being dealt with at the same time. The child did not rally from the shock of the operation, and died in sixteen hours after it. In another case the death is entered as due to iodoform poisoning. The fourth patient died from collapse on the eighth day after the

operation. He was also suffering from spinal caries, and was in a weak and very unhealthy condition before the operation. Four other patients are dead. In two cases death resulted from affections in no way connected with disease of the hip, viz., severe and long-standing heart disease in one and diphtheria in the other. One patient died of tuberculous meningitis eleven weeks after the hip was excised. The wound had not healed; it had not been drained in the first instance, and a tube had to be inserted later on, owing to distension of the wound with inflammatory exudation. The fourth patient died three years and a half after the excision, the hip being soundly healed at that time. We are informed by the child's mother that death was attributed to abscess in the brain.

In the completed cases, which number 17, primary union took place in 11 and 10 remained healed for over one year. In 20 cases (17 complete and 3 incomplete) recurrence of disease took place in 16. In 5 cases there was only one secondary operation; in 3 cases three, in 2 cases four, and in 1 case five secondary operations. The actual shortening was between 1 and 2 inches in 9 cases, 2 inches in 5 cases, $2\frac{1}{4}$ inches in 1 case, 3 inches in 1 case, and $3\frac{1}{2}$ inches in 1 case. As a rule, the apparent shortening was less, owing to slight abduction of the leg. In 2 cases there was immobility of the joint; in 4 cases there was scarcely any mobility; in the remaining 11 cases there was more or less free mobility.

Poor, of New York, $\frac{1}{\text{Apr.}23}$ reports the ultimate results in 66 cases of hip-joint excisions, as follow (by cure is meant that all sinuses have closed, and there is no symptom of trouble about the hip; by relieved, that sinuses are open): There were 32 children discharged cured, 25 died, 3 discharged relieved, 2 discharged not improved, and 4 in the hospital. Of those discharged relieved, in 1 the ultimate result is unknown, 1 died from causes not connected with the joint, and 1, when last heard from, was evidently affected with amyloid degeneration. Of those discharged not improved, 1 died shortly after leaving the hospital, and in 1 the result is unknown.

Of the cause of death, 14 died from amyloid degeneration, 1 from amyloid degeneration and peritonitis, 2 from general tuberculosis, 1 from acute nephritis, 1 from septicæmia, 1 from heart-failure, 1 from coma (uræmic), 3 from meningitis, and 1 from

exhaustion. In 3 of the fatal cases the wound was soundly healed and the children had the use of the limb some time before their death. In 1 case the knee-joint on the opposite limb had to be amputated, on account of advanced disease of that articulation. The period that elapsed from the time of operation to the date of death varied from 1 day (the case of heart-failure) to 5 years, the average being 17½ months. Of the cases of perforation of the acetabulum, 7 patients died and 4 recovered.

Of the 2 patients with perforation of the gut, 1 died from heart-failure soon after the operation. The other recovered, and has had no further trouble. He has been out of the hospital for three years, and is well.

There are two factors going to make up the amount of actual shortening of the limb: (1) that dependent on the disease—atrophy and arrested growth; (2) the amount of bone removed. In 3 cases it was three quarters of an inch, in 5 an inch, in 2 an inch and a quarter, in 2 an inch and a half, in 1 an inch and three-quarters, in 1 two inches, and in 1 four inches.

Of the patients discharged cured, the present condition of 23 is absolutely known: 1 is well 18 years after discharge; 1 is well 11 years after discharge; 2 are well 9 years after discharge; 1 is well 7 years after discharge; 2 are well 6 years after discharge; 1 is well 5 years after discharge; 1 is well 4 years after discharge; 1 is well 3 years after discharge; 4 are well 2 years after discharge; 9 are well 1 year after discharge.

In some cases of joint disease, after the removal of the head and neck, the cut surface of the shaft presents a dark appearance, the bone is soft and infiltrated, the periosteum is thickened and easily detached, so that the whole shaft can be easily forced out through the wound, leaving the periosteum intact. If the medullary cavity of the femur is reached by the section, it is found filled with dirty, dark-colored material; the external shell of the bone is thinned, of a dark color, and soft. Since 1884, Poor has, in all such cases, made an opening into the shaft of the femur, on its outer aspect, just above the knee-joint. Exposing the medullary cavity, a long probe, to which is attached a piece of silk thread, and to this a long strip of iodoform gauze, is drawn through the whole length of the cavity in the bone, so as to thoroughly remove its contents; it is then flushed out with bichloride solution,

iodoform dusted in, a drainage-tube inserted in the lower opening, and the wound in the soft parts closed, except where the drainage-tube protrudes. The result of this operation is, that all the diseased tissue is removed from the medullary cavity of the femur, and, unless there are other causes at work, the wounds close and recovery follows.

In 21 cases this condition of the shaft of the femur was found; in 11 the central cavity was cleaned out, and in 10 no operation was done. In the 10 latter cases, 8 patients died and 2 recovered. Of the 11 patients treated as above described, 2 died and 9 recovered,—1 of the patients dying from heart-failure, twenty-four hours after the operation; the other died three years later, from amyloid degeneration, the femur giving no further trouble. By recovery is meant that the excision wound healed. In one of the cases of recovery the whole shaft became enlarged, but has never given any discomfort.

RACHIOTOMY.

Urban [41 Aug.1] describes, at the German Surgical Congress, two cases of fracture of the spine, with paralysis of bladder and rectum, and motor and sensory paralysis. These cases were operated on, six and nine months after the receipt of the injury, by an incision on each side of the spine, three or four centimetres from the spinous processes, reaching to the junction of the bodies of the vertebræ and the laminæ. These longitudinal cuts were joined by a cross-cut, and, through the latter, the laminæ were chiseled off from the bodies of the vertebræ. Ten weeks after operation the first patient sat up, and a year after could walk and had control of his bladder. The second case fractured the twelfth dorsal vertebra, and nine months later had the spinous process of the first lumbar vertebra chiseled off. Twenty-four hours after the operation she had sensation in her legs, and could locate needle-pricks. In two cases of paralysis due to spondylitis the result of operation was not favorable.

SPONDYLITIS.

Casse, of Brussels, [52 Dec.26,'91] reports six cases of spondylitis where traction on the spinal column relieved the symptoms of which the patient complained, which symptoms returned whenever the traction was not effective; and concludes that, in all forms of Pott's

disease, the patient should have extension, and the spinal column should also be immobilized as completely as possible. Faucon and Lavrand, of Lille, [220 Aug.5] report a case of Pott's disease, high up in the cervical region, in which there were severe asphyxic seizures daily, during which the patient became cyanotic and her clothing had to be loosened. A plaster jacket and jury-mast were applied, and the child at once began to improve, and ultimately was cured.

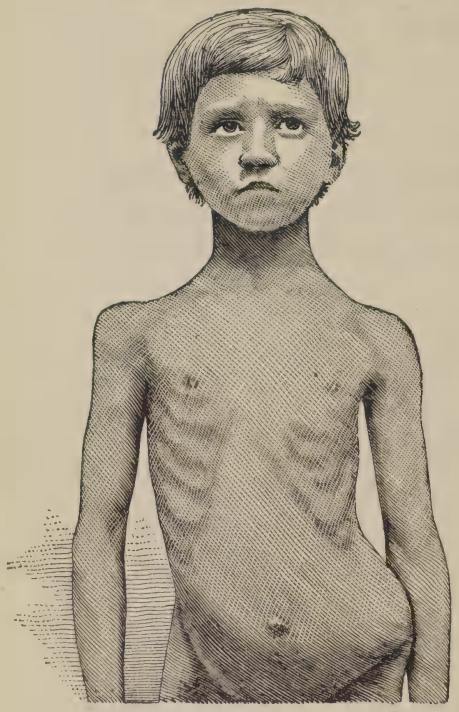


Fig. 1.—Pott's Disease with Lateral Curvature. (Front view.) (*Medical Record.*)

F. C. Schaefer [61 Dec.19,'91] reports three cases of spinal caries in which he cut down on the diseased vertebræ and curetted them. In the dorsal region he removes one or more transverse processes, and resects the heads of the ribs articulating with them, in order to reach the vertebræ. The periosteum is then pushed in front, to protect the pleura and sympathetic ganglia.

Vincent, of Lyons, [91 Apr.; 112 Sept.] advises the drainage of abscesses and the removal of diseased bone in Pott's disease of the vertebræ. The drainage-tube is to be passed, in **U**-form, either entirely in front of the vertebræ or directly through the bodies in front of the spinal canal. The operation is carried out by a vertical incision on each side of the spinal muscles, joined by two others drawn horizontally outward, converting them into **T**-incisions. One or more ribs are resected, to give access to the front of the spine, and then a blunt, curved probe is passed in front of the vertebræ, from one side to the other, and the drain drawn through under its guidance; or a curette is made to bore through the body of the affected vertebra, obliquely forward and inward, until it strikes an instrument held under the periosteum on the other side. The latter method

is employed where the body of the vertebra is broken down, and a curved drainage-tube is drawn directly through the bone. Two cases are given in which the operations were performed with success.

Lateral Curvature Associated with Pott's Disease.—Ridlon, of Chicago, [59 Sept. 17] reports two cases of Pott's disease which were mistaken for lateral curvature, by himself and by several other surgeons, until treatment showed the case to be one of Pott's disease. The exercises, prescribed under the impression that the case was one of lateral curvature, aggravated the deformity, causing symptoms which were quickly relieved by absolute rest and retentive apparatus. Reference is made to the articles on this same subject by Bartow, of Buffalo, [96 July, '89] and Lovett, of Boston. [99 Oct., '90]

FIG. 2.—POTT'S DISEASE WITH LATERAL CURVATURE. (Back view.) (*Medical Record.*)

Kirmisson [853 Nov.] draws attention to this same unusual condition in Pott's disease, and reports five cases which he has seen.

Barwell, of London, [6 Apr. 9] describes a method of applying plaster jackets that he prefers to suspension, as usually practiced, claiming that by this means he overcomes, to some extent, the deformity without incurring the danger of tearing apart adhesions. The patient sits on a stool, to which she is fastened by straps; a band, passing across the projection in the spine, draws the latter forward by means of a compound pulley by which it is attached to the wall, while points of resistance are furnished by other bands passing in front of the sternum and abdomen and fastened to the wall behind the patient, as shown on page 26.

[This method would seem to be more troublesome than the Sayre method of applying plaster jackets, and to possess no advantages over the old way.—R. H. S.]

Redard, of Paris, [55 Mar.26] describes the manufacture of a plaster bed recently recommended by Lorenz, and like the turtle-shell used by Sayre before he made his first plaster jacket. The patient is laid on the face, supported properly by pillows under the feet,

BARWELL'S METHOD OF APPLYING PLASTER JACKET.
(*Lancet.*)

thighs, chest, and head (see cut). Plaster bandages are then run up and down and diagonally and transversely; outside this, a layer of wood-wool soaked in plaster of Paris is spread over all the cotton bandages. If the disease is high up in the dorsal spine, or in the cervical region, a jury-mast is incorporated in the plaster.

PLASTER BED FOR POTT'S DISEASE.
(*Gazette médicale de Paris.*)

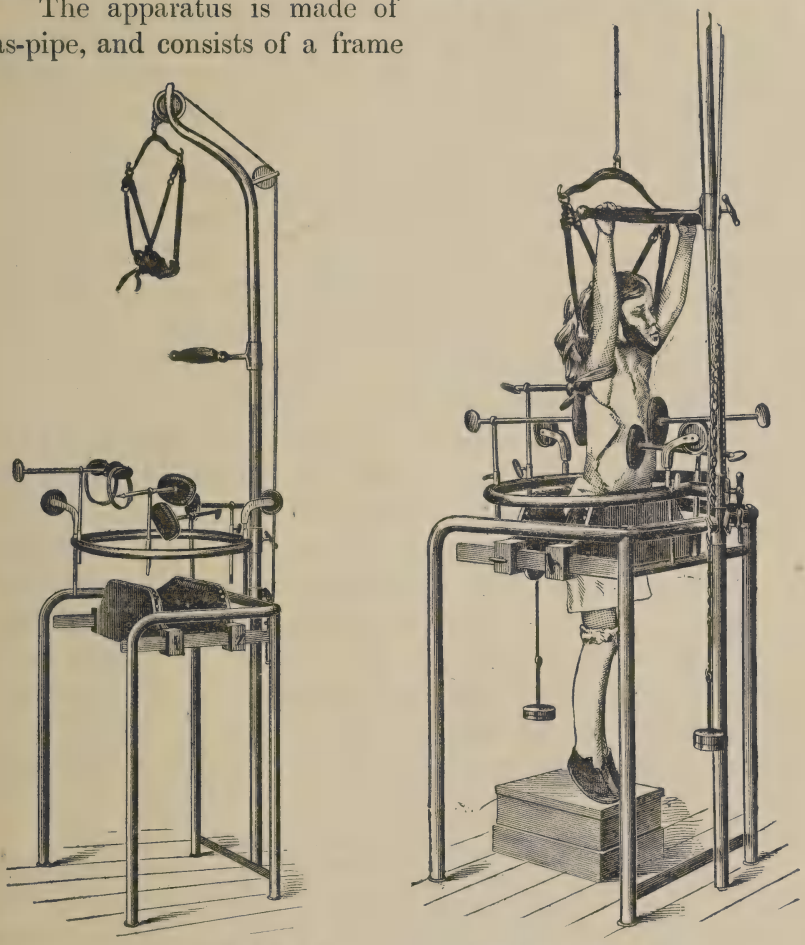
A. M. Phelps, of New York, [59 Jan.9] gives full details on the manufacture of wood corsets after the manner of Waldtuck, of Odessa, with some modification made by him in the technique. J. M. Hawkes, of New York, [9 Jan.16] describes a paper jacket made over a cast similar to those for making wood, leather, and wire corsets. He uses narrow strips of pure jute-fibre laid in various directions and glued together. The jacket is cut in two parts in the axillary line, and held together by an elastic cord. Vance, of Louisville,

Ky., made a paper jacket on much the same principle some fourteen years ago.

SCOLIOSIS.

M. Schede, of Hamburg, [69, Mar.24] describes an apparatus for the correction of the deformity of lateral curvature. (See figures.)

The apparatus is made of gas-pipe, and consists of a frame



APPARATUS FOR CORRECTING LATERAL CURVATURE.
(*Deutsche medicinische Wochenschrift.*)

with an upright high enough to support a pulley, over which runs a rope attached to the ordinary head-swing. The end of the rope terminates in a chain, which is made fast to a catch when the patient has been sufficiently stretched. There is a second independent bar, which the hands grasp while the arms are extended

over the head. The patient stands on the toes, and thus the spine is stretched as much as practicable.

A pair of padded wooden blocks are fastened in front and back of the pelvis to hold it stationary. This frame passes around the body just below the anterior superior spines of the ilium. Higher up there is a ring of gas-pipe fastened to the large frame, and supplied with movable pulleys and padded rests. This gas-pipe ring encircles the body. In order to untwist the spine, a piece of adhesive plaster, fifteen to twenty centimetres wide and terminating in a ring, is fastened to the convexity of the ribs, beginning very near the spine and passing toward the front under the axilla. Another piece of plaster is put on the projecting ribs of the other side, in front, passing backward under the opposite arm.

To the rings in these plasters cords are attached, which pass over pulleys fastened on the encircling ring of gas-pipe, and to the ends of these cords weights of two or more pounds are attached. The pulleys are so placed that the cord from the ring is horizontal, and pulls a little inside of a sagittal tangent to the curve of the ribs. To keep the upper part of the body from rotation, under the influence of the force applied by means of the plasters and pulley-weights, the shoulders are held by an iron brace that runs up from the encircling gas-pipe ring to grasp the axilla. Padded cushions are also placed against the most projecting parts of the ribs, in front and back, to aid the plaster tractors in changing the direction of the prominence. These make pressure by means of long screws which run from the gas-pipe ring, and care must be taken that they push *away* from the spinal column, and do not make direct lateral pressure, or else their tendency would be to increase the deformity.

If, as usually exists, there is a second curve in the spine, with a fullness of the lower ribs on the side opposite the upper dorsal convexity, then other adhesive-plaster strips are put on this convexity, running around this side of the body in the direction opposite to the plasters just mentioned. The tendency of these second plasters is to twist the lower part of the back in the direction opposite to that in which the upper part is twisted, and is supplemented by more padded cushions, which press against the projecting parts of the lower trunk in a similar way to the pads mentioned earlier as applied to the thorax.

The principle, undoubtedly, is correct,—stretching the body as far as practicable to straighten it, and then, while the shoulders and hips are held in position, untwisting the rotated vertebræ as far as possible by force applied to the ribs. The application of adhesive plaster to the sides of the chest with pulleys and weights more closely simulates the action of the hands than the apparatus of Bradford and of Hoffa, which combine the other essentials of Schede's machine with this exception. Manipulation has been of undoubted service, and experience may show that it can be well supplemented by this mechanical aid to untwisting the spinal column, which is the vital point to be gained in treating scoliosis.

Reginald H. Sayre, of New York, presented, before the Society of the Alumni of Bellevue Hospital, $\frac{1}{\text{Apr.16}}$ a remarkable example of congenital lateral curvature of the spine in a girl 14 years of age. At the time of her birth it was noticed that she had a short, catching respiration, and a few hours later a careful examination showed that there was a marked lateral curvature of the spine with rotation of the ribs on the left side. The case was a transverse presentation, and it is possible that manipulation caused a separation of the ribs from the costal cartilages. There had been an attack of pneumonia on the side of the concavity at the age of 6, followed by an abscess, which probably communicated with the pleura, and this, presumably, aggravated the pre-existing lateral curvature. When presented to the society there was a large V-shaped gap between the upper and lower ribs, through which the liver could be felt; the lower ribs were crowded together below the brim of the pelvis.

E. H. Bradford, of Boston, $\frac{1}{\text{Oct.1}}$ read, before the American Orthopædic Association, September 20th, a paper on lateral curvature, and described a new method of treatment which he had been trying, during the past six months, in severe cases with marked rotation and continually increasing curves, and also in cases where the curves were nearly fixed. The method consisted in suspending the patient in the ordinary way and applying plaster bandages; then, while the plaster was hardening, in making very strong forward and backward pressure on the ribs by means of screws and plates. This was, of course, very harsh treatment, and, before trying it on others, he had submitted himself to it, and had been

surprised to find that the discomfort was not so great as one would suppose.

De Forest Willard, of Philadelphia, thought the pain would be so great as to prevent a continuance of the treatment. He recalled a very severe case in which he had attempted forcible reduction, and, while it did not cause much discomfort during that day, it caused so much suffering at night that he was compelled to remove it before morning. Ryan, of Cincinnati, had also tried to effect reduction by direct pressure, and been compelled to abandon the treatment.

McKenzie, of Toronto, was then experimenting with a very similar contrivance, although he did not expect much from mechanical appliances in the treatment of lateral curvature. Ketch, of New York, asked if the pressure interfered with respiration. Bradford said that the pressure had been made from behind, directly forward on the projecting ribs, and he had not observed any embarrassment of respiration.

Lesions of the Spinal Cord in Lateral Curvature.—At the Anatomical Society of Paris, Klippel $_{\text{Nov.20,'91}}^{14}$ showed sections of the spinal cord of patients with lateral curvature, which dated from birth or very early infancy. He had made autopsies on three cases where the curvature had dated from very early life, and in two cases had found lesions of the spinal cord, both visible to the naked eye and demonstrable by the microscope. The atrophied cornu was triangular in shape, the point of the triangle looking forward. In two cases the lesion was present throughout the entire length of the dorsal cord, and in one of these the lesion could be traced to the cervical region with the same characteristic markings. The muscles of the side corresponding to the atrophied area of the cord were in an advanced state of degeneration. The ribs and vertebræ on the same side participated in this trophic lesion.

There were no symptoms of rickets in these cases, and the author proposes the name myelopathic scoliosis to designate them. The question arises whether the cord-lesion is primary, and the cause of the changes in the muscles and bones, or whether it is secondary to the lateral curvature or co-existent with it. Klippel thinks the weight of evidence is in favor of the cord-lesion being primary, and assumes that it took place before birth, or soon after,

and that the changes in the bone and soft parts followed as a consequence of innervation.

The lesion did not correspond exactly to the appearances of infantile paralysis. There was a regular, absolute atrophy, without a break, going from the lumbar to the cervical region. This is one reason why he is willing to admit the possibility of an arrest of development.

Before the Orthopædic Section of the New York Academy of Medicine, Berg $\frac{1}{\text{Apr.}2}$ reported a case of lateral curvature with lateral sclerosis of the spinal cord. He held that the primary lateral sclerosis in this case was the result of defective blood-supply, in consequence of the lateral curvature. In the discussion that followed the report, it was held by almost all the members that the occurrence of a lateral sclerosis was a coincidence rather than a result of the lateral curvature, one surgeon, who had seen the case, being of the opinion that sclerotic areas were present in the brain as well as in the spinal cord. Different neurologists, who had also seen the case, had disagreed as to the diagnosis.

New Method of Making Plaster Casts of the Thorax in Cases of Rotary Lateral Curvature.—Mary Putnam Jacobi $\frac{1}{\text{Apr.}2}$ exhibited a series of models which she had prepared by an original method. It had been suggested to her by observations made with the cyrtometer upon the condition of the thorax after empyema. An outline of the thorax at the desired level was first taken with a cyrtometer (which was an instrument consisting of two strips of soft lead united by a hinge), which was placed over the vertebral column, and the lead strips closely applied to the chest-walls. The lead was next placed upon a slab of marble, where it served as a sort of shallow frame, into which the plaster-of-Paris cream was poured and allowed to set. This gave, practically, a thin plaster cast representing a section of the thorax at the point around which the cyrtometer was passed.

SPINA BIFIDA.

Powers, of New York, $\frac{59}{\text{July }16}$ reports a successful case of excision of meningocele in an adult, and gives also a table of 34 cases treated by excision. Three of these cases are withdrawn, as the result or the cause of death seems indefinite, leaving 31, with 7 deaths directly due to the operation,—a mortality of 22.58 per

cent. He has also been able to collect 15 cases treated by Morton's iodo-glycerin injection, with 4 deaths,—a mortality of 26.66 per cent. Powers's patient was afflicted at birth with a spina bifida, the tumor being the size of an orange during childhood. His mother had frequently pricked this tumor during the first years of life, dressing it with a "burnt rag." It gradually grew smaller, and gave him no annoyance. Up to the age of 28 he had had no vesical or rectal incontinence, no evidences whatever of any affection of the nervous system, except that, after his fifteenth year, he noticed that, when the clothing or a bandage irritated the tumor, locomotion was somewhat interfered with. At 28 years of age he gradually began to lose power in the legs. The right was affected first, and most exclusively, the left being involved later. The heels dragged, and there was dull, aching pain and soreness about the hips, extending down the back of the thigh, this being worse on sitting. Occasionally he had had sharp pains in the loins, hips, and knees, sufficiently severe to throw him down. These came on at irregular intervals, perhaps once a month. Obstinate constipation, occasional attacks of urinary incontinence, and at times difficulty in commencing micturition were present. After operation the general condition improved for a time; there was more control of the bowels, and the patient could balance himself better on his crutches. Later on his symptoms became worse, and the pain in the buttocks increased. The patient was then thought to have hydromyelia.

Neine [505 No.41,'91] reports a successful case of ligation and excision of a spina bifida, in a child 5 days old. Poncet, of Lyons, [3 Apr.27] reports another successful case, in an infant of 20 months. The tumor was a sacral one, of enormous size, reaching to the popliteal space. It was incised in its long diameter, and about 2 litres (quarts) of bloody fluid allowed to escape. The edges of the opening into the spinal canal were freshened and sewed up; the sac was then extirpated and the skin sutured. Monon, of Paris, [3 Mar.23] reports a case of spina bifida, 4 hours old, successfully removed by Walther. Jas. Bell, of Montreal, [282 Apr.] and F. J. Groner, of Grand Rapids, [59 Aug.20] also report successful cases of excision.

Bobroff, of Moscow, [336 June 4] reports a successful case of myelomeningocele of the sacrum, in which he closed the bony defect by a piece removed from the crest of the right ilium. This fragment

measured one and one-fourth inches in length by three-fourths in breadth and less than one-half inch in thickness. It was left attached to the erector spinæ, but released from all other attachments. The edges of the vertebral hole were freshened and the bony fragment sewed in position, the side covered by periosteum being toward the canal and the raw side toward the skin. Fell, of Wellington, New Zealand, [557 Jan.] reports a cure from injection of Morton's iodoglycerin fluid, as does, also, Pearcy. [2 Nov.22] In neither case was paralysis present. Lemoin Bourges [211 Sept.25] operated successfully on a girl, 8 months old, who had a congenital mass on the lumbosacral region. It proved to be a lipoma, passing between two vertebræ, to be inserted into the meninges. The only case similar is reported by Athol Johnson.

Paul Berger [100 Jan.14] reports a case of lumbar spina bifida, in which he cut down on the spine, opened the sac, detached a cord that resembled a prolongation of the spinal cord, and replaced it within the vertebral canal. The exuberant part of the meningeal sac was excised, and the sac sewed up. A piece of the scapula of a young rabbit, of the exact size of the bony defect in the vertebra, was inserted in the spine and the external wound closed. The patient recovered, with a good cicatrix. There is no bulging at the site of injury, but the case was reported too soon after operation to give results as regards improvement in the paralysis which was present, or the continuance of firm bony union between the vertebræ and the inserted scapula.

TORTICOLLIS.

Lezinsky [108 '91] has published a case of muscular torticollis successfully treated by hypodermatic injections of atropine, beginning with $\frac{1}{200}$ grain (0.00032 gramme) and ending with $\frac{1}{45}$ grain (0.00144 gramme). Eight injections were required to complete the cure. Stanley M. Ward, of Scranton, Pa., [112 Aug.] commenting on this paper, refers to a lecture by J. M. Da Costa, [2102 v.1,'68] published in 1868, in which it was stated that similar treatment produced a cure; and he says that he has twice had a like result in his own practice.

Henry L. Shively, of New York, [101 May] reports a case of spasmodic torticollis in a man addicted to sexual excesses. The upper fibres of the right trapezius and both sternal and clavicular portions of the sterno-mastoid were firmly contracted. Medical treatment

having failed, an inch of the right spinal accessory was excised. When the patient recovered from the anæsthetic it was found that there was still spasm in some of the deep rotators of the neck, and he was kept under morphine for some days. Later on these spasms were controlled by hypnotic suggestion. Five months after operation, the patient could carry the head erect, without spasm, but there is still slight rotation toward the right.

Major and Appleyard $_{\text{June 18}}^{6}$ report a case of spasmodic torticollis treated by excision of a portion of the spinal accessory, with relief of spasm. Some months afterward the patient developed a similar condition on the opposite side of the neck.

Wardrof Griffith and Halwell $_{\text{Apr. 9}}^{2}$ describe a case where the right sterno-mastoid and trapezius were deeply involved, but in which many of the deeper muscles of both sides of the neck also participated in the spasm to some extent. After removal of part of the right spinal accessory, the patient was slightly more comfortable. All movements ceased for a few days, but then those due to action of the deep muscles of the neck recommenced, and had continued.

Edmund Owen, $_{\text{June 18}}^{6}$ in reporting a case in which he resected a portion of the spinal accessory for spasm of the sterno-mastoid muscle, draws attention to the fact that the nerve enters the muscle so deeply that the latter must be relaxed and turned well over in order to find the nerve, and that unless a very long incision is made the nerve may be missed altogether.

A. Pearce Gould, of London, $_{\text{June 18}}^{6}$ reports a case of spasm of the sterno-mastoid in which, while endeavoring to resect a portion of the spinal accessory, he accidentally pulled it out by the roots. The case did well, and he has since intentionally repeated the operation twice for spasmodic torticollis. C. A. Powers, of New York, $_{\text{Jan.}}^{242}$ presented a case before the Neurological Society, in which there had been violent spasm day and night of the posterior rotators. He therefore removed a piece from the posterior roots of the first three cervical nerves, after the plan suggested by Keen, and described in last year's ANNUAL (vol. iii, G–13). The spasms ceased after the operation, but the head had turned to the right, owing, perhaps, to the patient's neglect of instructions as to massage. The power of the right arm has also improved by the operation. Noble Smith, of London, $_{\text{June 18}}^{6}$ describes two more

cases in which he has resected part of the posterior roots of the first four cervical nerves with marked and continued benefit. He has now operated on four patients with improvement. F. A. Southam, of Manchester, $\frac{6}{\text{June } 25}$ reports four cases of spasm of the sterno-mastoid that have remained cured from two to eight years after operation. Stuart McGuire, of Richmond, Va., $\frac{81}{\text{Oct.}}$ draws attention to the use of the ordinary Sayre jury-mast, as used for Pott's disease, in the treatment of torticollis, as a means of holding the head in good position subsequent to operation.

RESECTION OF THE ANKLE.

Bogdanik, of Biala, $\frac{336}{\text{No. 5}}$ describes a new method of removing the astragalus or the os calcis, which avoids injury to both arteries

RESECTION OF THE OS CALCIS.
(Centralblatt für Chirurgie.)

and nerves. The surgeon stands on the right side of the patient, and begins his incision just below the external malleolus in case of the left foot, or the internal malleolus if the right foot, and carries the incision obliquely downward and backward, about one centimetre above the sole of the foot, rounding the heel and going up near the opposite malleolus. The foot is then brought up in front of the shin, exposing the astragalo-calcanean joint; the former bone may be removed, if diseased, and the lower end of tibia and fibula examined. The os calcis can be removed in part

or altogether, according to its condition. By this method the author has removed the whole of the astragalus in one case and a portion of the calcaneum in another, without injuring any tendon or large vessel, and with scarcely any loss of blood. In the first case the divided portions of the calcaneum were fixed together by wire sutures.

AMPUTATIONS, EXCISIONS, AND PLASTIC SURGERY; DISEASES OF BONES AND JOINTS.

By P. S. CONNER, M.D.,
AND
LEONARD FREEMAN, M.D.,
CINCINNATI.

AMPUTATIONS.

Barker, of London, [6 Jan. 2] reports 50 consecutive major amputations, made since 1876, with 46 recoveries and 4 deaths,—1 of pulmonary phthisis in 21 days, 1 from shock (double amputation of legs), 1 of asthenia in 17 days, and 1 of asthenia in 29 days. Hence in only one case could death be attributed to the operation itself, thus reducing the mortality to only 2 per cent. Jackson [6 Jan. 9] questions the value of these statistics, as the ages of the patients are not given. Marie [3 May 8] calls attention to the fact that a large number of those who have lost a limb by amputation die of pulmonary tuberculosis. Shaud [2 May 21] recommends the application of ice-bags to an extremity for a short time before and for two or three days after an amputation. The ice is valuable, both as a hæmostatic and an antiseptic; it also promotes rapid healing of the wound. McCurdy [1 May 7] has so modified Wyeth's method of amputating at the hip-joint that a flap operation with immediate disarticulation may be done. A single needle is used, inserted at the most prominent point of the great trochanter, passing directly through the thigh immediately in front of the femur, to come out just below the tuber ischii. As will be seen in the illustration, hæmorrhage is controlled by an Esmarch strap wound in a figure of eight around this needle. The second illustration shows how the same method may be applied to amputations at the shoulder-joint. McCurdy [1 Nov. 28, '91] has also invented a flap-retractor, intended to facilitate the sawing-off of bones in an amputation and, at the same time, to protect the soft parts. As will be seen in the illustration, it consists of two metal plates with an interosseous tongue.

Hip.—Boone $^{9}_{\text{July 16}}$ prefers to avoid the injury to the tissues, by the transfixion needles in Wyeth's method, by holding up the Esmarch tube with a piece of non-elastic suspenders, attached to a band around the sound thigh on the one side and to the tube on the other, the tension being regulated by tightening up the suspenders. Thornton $^{364}_{\text{June 15}}$ controlled the hæmorrhage, while amputating at the hip-joint, by transfixing and then passing a rubber tube alongside of the knife. While making the anterior flap,

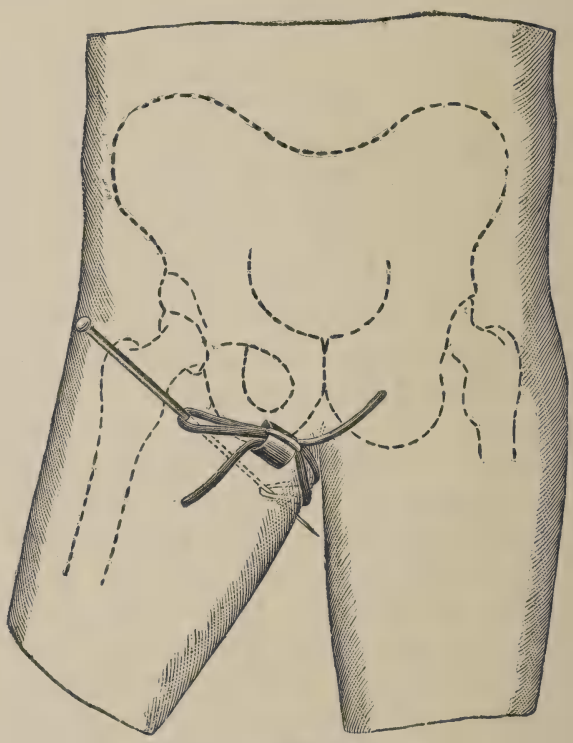


Fig. 1.—Bloodless Amputation.
(*New York Medical Journal.*)

the tube was tied over the soft parts. A similar procedure was adopted for the posterior flap. Ten amputations at the hip-joint, all except one for morbus coxæ, and made during the last fourteen years, are reported by Richard Davy, of London. $^{2}_{\text{Nov. 21}}$ The mortality, formerly 60 per cent., is reduced to 20 per cent.; this is to be attributed to surgical cleanliness, nursing, anæsthetics, etc. In nine of the ten cases, hæmorrhage was controlled by the operator's lever. He states that the weight of a lower extremity is about

one-thirteenth of that of the body. Moore, of Minneapolis, [105 Apr.1] reports a successful amputation at the hip, for hip-joint disease, using the Furneaux-Jordan method; and Warren, of Boston, [99 Nov.19,'01]

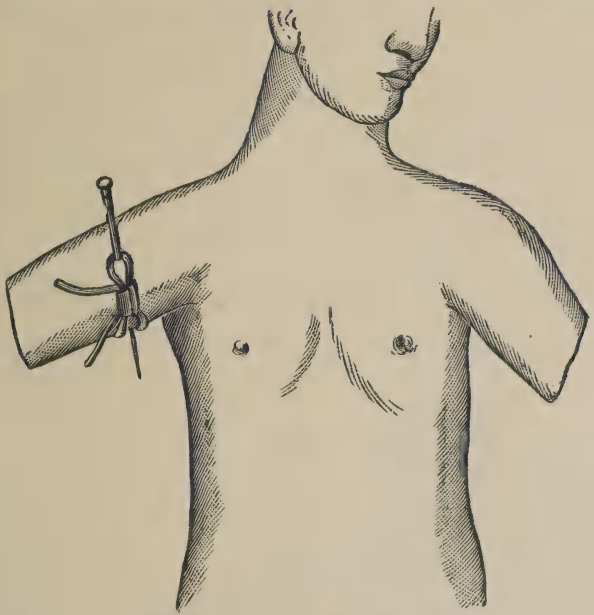
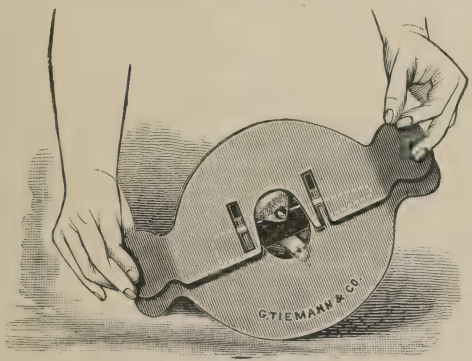


FIG. 2.—BLOODLESS AMPUTATION.
(*New York Medical Journal.*)

reports two other cases. In amputations at the hip-joint, for osteosarcoma of the thigh, the most frequently adopted methods



FLAP-RETRACTOR.
(*New York Medical Journal.*)

were those of Wyeth and Furneaux-Jordan. In a case reported by Reverdin, of Geneva, [214 July 1] the osteosarcoma had been growing for the unusually long period of ten years, while the case reported

by Keen, of Philadelphia, $^{9}_{\text{Mar.26}}$ was in the fifth month of pregnancy, the course of which was undisturbed. Moty, of Paris, $^{10}_{\text{Aug.30}}$ as reported by Chauvel, operated on a case which had been mistaken for a backward dislocation of the tibia with effusion of blood into the knee-joint.

Thigh.—Anderson, of Kansas City, $^{72}_{\text{Dec.,'91}}$ successfully amputated a thigh for enchondroma of the lower end of the femur, which measured forty-five inches in circumference, and also involved the knee-joint (see illustration). Hartley $^{1}_{\text{June 4}}$ mentions a case in which the thigh had been amputated through the trochanter minor, for osteosarcoma of the femur, and which had remained free from a recurrence for five years. Prewitt, of St. Louis, $^{364}_{\text{May 11}}$ reports an amputation of the thigh for tuberculosis of the knee-joint.

ENCHONDROMA.
(*Kansas City Medical Index.*)

Amputations of the thigh for sarcoma of the upper end of the tibia, the knee-joint not being implicated, are reported by Poncet, of Lyons $^{211}_{\text{Apr.3}}$; Sabattier, of Lyons $^{211}_{\text{Jan.}}$; Sutcliffe, of Indianapolis $^{56}_{\text{Aug.}}$; and Poore, of New York. $^{1}_{\text{Apr.27}}$

Knee.—A successful amputation at the knee-joint, with lateral flaps, is reported by Lane, of London, $^{22}_{\text{Sept.28}}$ who claims that the lateral flaps are not only shorter and less liable to slough, but that they also allow of much better drainage than does the long anterior flap.

Foot.—Albert, of Vienna, $^{84}_{\text{Dec.12}}$ has so modified Chopart's amputation that, according to Billroth, hyperextension of the stump is certainly avoided. The skin incision is made as in the ordinary operation, but the tendons of the extensor dig. com. are divided three centimetres below the line of the skin incision. The joint

is opened between the scaphoid and the cuneiform bones, all three of which are removed, and the cuboid bone sawed through transversely. Two holes are bored through the cuboid and one through the scaphoid, through which the tendons of the common extensor are passed and sutured to the plantar fascia. Loison [243 Nov.,'91] has introduced a new osteoplastic method of amputating the foot by aid of a vertical, antero-posterior division of the calcaneum.

Heidenhain, of Marburg, [69 Nos.36,37,'91 ; 80 Feb.] concludes that while diabetic gangrene is generally due to the common cause of senile gangrene, namely, arterio-sclerosis, there is, in diabetes, an increased susceptibility to wound-infection. He states that, as long as only one or two toes are affected, it is safe to wait for the line of demarkation. Extension of the gangrene to the sole or back of the foot indicates amputation. Amputation below the knee should not be made. Widenmann [336 June 25] agrees with Heidenhain, but sees no reason why amputation of the leg should be discarded in peripheral plugging or in senile gangrene ; it should, however, be done, not under the Esmarch strap, but while the hæmorrhage is controlled by compression only. Spencer, of London, [2 June 18] strongly recommends amputation through the thigh, supporting his position by reference to cases cited by Roser, König, Kraske, Heidenhain, Küster, and others. Reference to Küster's cases will be found in the ANNUAL of last year (vol. iii, H–4). Successful amputations of the thigh for senile gangrene are reported by Kakelas, [1 Feb.20] and Powers, of New York. [1 May 21]

Conical Stumps.—McCosh, of New York, [101 Sept.] says that these are rare, except after amputation of the arm or leg, due to the fact that the main growth of both humerus and tibia is from their upper epiphyses. In children, the nearer the amputation is to the joint, the greater the probability of a conical stump.

Shoulder.—Marsh, of London, [6 Sept.17] after tying the subclavian artery, amputated at the shoulder-joint, for osteosarcoma of the humerus weighing thirty-three pounds ; the hæmorrhage was insignificant.

Upper Extremity.—A successful interscapulo-thoracic amputation, for small round-celled sarcoma of the infra-spinatus muscle, is reported by Chavasse, of Birmingham. [6 Aug.27] The suggestions of Berger were carried out, namely, resection of the clavicle in its middle third, double ligation and division of the subclavian artery and vein, and formation of anterior and posterior skin-flaps. No

recurrence after three months. Delorme $\frac{3}{\text{June } 22}$ amputated the entire upper extremity for osteosarcoma of the upper end of the humerus. Kirmisson thought that in such cases the removal of the scapula was unnecessary; this belief was shared by Quénu and Peyrot on the grounds that extension of the sarcoma took place not so much along the bone as through the soft parts. Treves, of London, $\frac{6}{\text{Nov. } 21}$ reports two successful operations,—one for sarcoma and the other for carcinoma of the breast.

EXCISIONS.

Phocas, of Lille, $\frac{118}{\text{Aug.}}$ condemns the typical resections for tumor albus in children under 10 years of age, and advocates partial operations. He is in favor of a transverse incision, and aims rather to remove all of the affected tissue than to obtain a movable joint. Lesions of the bones are removed by the knife, gouge, or curette. Arthrectomies in children are best made either before the disease has had time to affect the bone to any great extent, or when such lesions have become limited, though not cured.

Knee.—Lingenfelder, of Munich, $\frac{336}{\text{June } 25}$ reports seventy arthrectomies for fungous disease of the knee-joint, made by Angerer, in the Munich clinics, from April, 1886, to August, 1889. Operations done as follows: Esmarch strap; curved incision beneath the patella, convexity downward; division of the lig. pat. propr.; removal of the diseased tissue with scissors, knife, sharp spoon, and saw, when necessary; mopping-out of joint with iodoform gauze; drainage; two catgut sutures in lig. pat. prop.; seldom bone-sutures; skin-sutures; permanent dressing (twenty to thirty days); later on, plaster dressing. Results:—

	Complete Cure.	Incomplete Cure.	Secondary Amputation of Thigh.	Deaths. Remarks.
I. 28 cases under 7 years of age	13	6	2	7 { 1 of scarlet fever. 1 of diphtheria.
II. 25 cases between 7 and 14 years of age	15	7	3	
III. 17 cases over 14 years of age	15	1	. .	Result of one case unknown.
Total, 70 cases .	43 cases,—about 63 per cent.	14 cases,—about 20 per cent.	5 cases,—8 33 per cent.	7 cases,—10 per cent.

Primary union in 48 cases (70 per cent.). Local recurrence in 10 cases (15 per cent.), but in 5 of these a good result was finally obtained. Average length of time in hospital, four weeks. Average length of time under observation, one and one-half years. In 29 cases, mostly children, the disease began in the synovia; in 49 cases, in the bones. When pus is present, in large quantity, the prognosis is bad. Age influences the results so largely that, while the percentage of cures during the first years of life is only 55 per cent., in adults it amounts to 95 per cent. Helferich, of Munich, [34 Aug.9] after further experience with his curvilinear resection of the knee, which he invented for angular ankylosis of that joint, now recommends this method in all simple typical resections. Ollier, of Lyons, [3 Apr.27] regards resection as superior to synovectomy and other atypical operations on the knee. A firm bony union is assured by suturing the bones and preserving the periosteum.

Foot.—A new incision for the resection of the os calcis or astragalus is described by Bogdanik. [336 Feb.6; 3 Mar.2; 41 Aug.22; 101 Apr.] The skin-incision, commencing just beneath one malleolus, extends downward and backward toward the middle of the heel, where it reaches a point one centimetre above the plantar surface; and then, in the same manner, runs to beneath the other malleolus. The os calcis is now sawed through in the direction of the skin-incision. The author claims the following advantages: 1. Incision is small. 2. No injury done to vessels, tendons, muscles, or nerves. 3. Scar is favorably situated. 4. The configuration of the foot is preserved. Shepherd, of Montreal, [282 Aug.] reports two successful cases of excision of the astragalus for compound dislocation.

Rose, of London, [22 Dec.23,'01] operated upon a case of necrosis of the astragalus and the lower end of the tibia, by an original method. The patient was placed in the prone position, and a semilunar incision, with its horns upward, made across the sole of the foot around the heel, the os calcis sawed through in the line of the incision, and then the flap—bone and all—turned upward and backward out of the way. Free access to the joint was obtained without injury to the tendons, which were pulled to one side.

Clavicle.—Subperiosteal sarcoma of the inner end of the clavicle caused Caddy, of London, [26 Sept.] to remove the inner two-thirds of this bone. An incision over the clavicle met, at its sternal end,

another incision which, starting at the level of the cricoid cartilage, followed the anterior border of the sterno-mastoid muscle, and extended three inches below the sterno-clavicular articulation. After the clavicle had been sawn through and freed of muscular insertions, the inner end was disarticulated. The sternum was not involved, although a prolongation of the growth extended down behind the manubrium, and occasioned considerable difficulty in its removal. No return of the growth after six months. Patient has almost unimpaired use of the arm. Caddy has collected twenty-eight cases of excision of the clavicle for sarcoma; the first case was that operated on by Mott in 1828, the patient living fifty-four years. The mortality is not given.

Sternum.—Two resections of the sternum are reported by Dollinger, of Budapest. $^{41}_{\text{Aug.22}}$ The first was for a pre- and post-sternal abscess, tubercular in character, the communication being about in the middle line and opposite the fourth rib. The sternum was removed from this point to the xiphoid cartilage. The second operation was for an abscess lying over the centre of the sternum, and necessitating the removal of one centimetre of the manubrium and three centimetres of the gladiolus.

Scapula.—Jaboulay $^{211}_{\text{Nov.8,'91}}$ reports two cases of excision of the scapula. The first was a total subperiosteal excision for pan-osteomyelitis; complete regeneration of the bone occurred with restoration of function. The second operation was a partial excision, the neck and glenoid cavity being allowed to remain. Sutton, of London, $^{22}_{\text{Nov.11,'91}}$ reports the removal of the right scapula for tuberculosis; and Péan, of Paris, reported by Ernest Hart, $^{2}_{\text{Mar.5}}$ a similar operation for fibrosarcoma.

Shoulder.—Southam, of London, $^{2}_{\text{June 4}}$ reports what he regards as the first operation for a similar cause,—the resection of the head of the humerus for frequently-recurring dislocations, the patient being an epileptic. The result of the operation was regarded as good. The false joint was a useful one, and dislocation did not again take place.

Hand.—Studsgaard $^{3}_{\text{July 27}}$ has, in three cases, successfully applied to the hand the method employed by Obalinski in operating upon tuberculosis of the tarsus. He splits the hand vertically, beginning the incision between the third and fourth fingers, and avoiding the median nerve which lies to the radial side. The operation is indi-

cated in tuberculosis of the bones of the metacarpus or of the carpus, especially when affecting those of the second row. Inspection of the diseased area is rendered easier, and the functional result is better than that obtained by other methods. Guermonprez, of Lille, [3 Aug.17] concludes, from two cases on which he has operated, that (1) resection of the lower end of the ulna will preserve the movements of pronation and supination when the ankylosis is limited to the inferior radio-ulnar articulation; (2) the operation does not produce the condition known as radial club-hand; (3) the resection is just as useful when primary as when secondary.

DISEASES OF BONE.

Tuberculosis.—Tuberculous osteomyelitis attacking shafts of long bones is, according to Reichel, of Würzburg, [226 v.43; 451 July] generally observed in patients presenting the ordinary forms of tuberculosis in other bones. It may be primary or secondary to disease of a neighboring joint or epiphysis. Occasionally it is so acute in its symptoms and course as to closely resemble ordinary osteomyelitis, this form requiring just as prompt operative interference as does the septic variety. The treatment of the other, more chronic form, is the same as that of tuberculous bone disease elsewhere. Krause, of Halle, [107 June 15] advocates the use of Billroth's method in the treatment of osseous and articular tuberculosis. This consists in a free exposure and complete removal of the tuberculous material; then, after arresting all hæmorrhages, the wound is sutured, except where a trocar-cannula allows of the filling of the cavity with a 10-per-cent. iodoform-glycerin solution. After removing the cannula the wound is completely closed. When there has also been an infection by the pus-forming micro-organisms, he recommends stuffing the wound with iodoform gauze, and, on its removal, after five or six days, the use of the iodoform-glycerin injection and sutures. Mauclaire [100 May 14] has published an exhaustive review of the anatomy and physiology of tubercular osteo-arthritis, with therapeutic deductions. Dandridge, of Cincinnati, [53 June 18] also contributes an excellent paper on tuberculosis of bones and its treatment.

Osteomyelitis.—In a review of a paper by Mirovitch, of Paris, [55 Sept.3] on the different forms of osteomyelitis, we find given, as characteristics of the form due to the *pneumococcus*, a rapid evolution, causing considerable general disturbance, with a tendency

to cicatrization and slow repair. Osteomyelitis due to the *typhoid bacillus* begins insidiously, and causes no great elevation of temperature; pain, at first slight, may become excruciating, while the typhoid condition continues. Arnaud, of Marseilles, $^{46}_{\text{May 1}}$ reports a case of acute osteomyelitis, in which there were present the symptoms, as given by Lannelongue, pointing to an infection with the streptococcus,—*i.e.*, very acute onset; the fever, which at first was intense, soon became remittent; the slight intensity of the spontaneous pain; rose color of the skin; and, above all, the absence of the net-work of skin-veins. On bacteriological examination of the pus, it was found to contain only *staphylococci.* Hence Arnaud concludes that the differential signs, as given, have no absolute value. Edmund Owen, of London, $^{22}_{\text{May 25}}$ says that "possibly there are some streptococci lurking in the blood of all children, and of adults, for the matter of that; and it only needs a certain lowering of the vitality of any tissue in order that the micro-organism may proliferate in a particular spot, and set up disastrous inflammatory changes." "As a rule, the lowering of the vitality of the tissue is brought about by an injury, such as a kick, a blow, or a wrench." When pus has formed at the end of a diaphysis it may take one of several directions: 1. It may find a way out beneath the periosteum, stripping up that membrane and forming an abscess. 2. Directly outward through the junction cartilage and through the skin. 3. Through the epiphysis and into the joint. Some of the most acute cases of hip-joint disease are due to osteomyelitis.

The treatment should consist in early and thorough exploration of the bone under chloroform, by aid of scalpel and trephine; and if the surgeon is determined to obtain the best results in the greatest number of cases, he must entirely free his mind of the notion that exploration of bone cannot be justified unless pus is discovered. There is probably no class of cases in which the result is more under the influence of surgical enterprise than that of acute septic diaphysitis. Lejars $^{100}_{\text{Nov.12,'91}}$ calls attention to the frequency with which acute osteomyelitis skips from one part of a bone to another, or even from one bone to another. This may also occur in chronic osteomyelitis, even after the lapse of months or years. Morris, of New York, $^{1}_{\text{Mar.19}}$ claims that the failure of the decalcification process for the removal of carious and necrotic bone is due to the fatty and

caseous materials present preventing the acid from penetrating far enough. This he seeks to remedy by alternating a 2- or 3-per-cent. solution of hydrochloric acid with an acidulated pepsin (pepsin, ½ drachm—2 grammes; hydrochloric acid, 16 minims—1 gramme; water, 4 ounces—118 grammes). Even tuberculous cases may be so treated. If suppuration is free the cavity should first be cleansed with peroxide of hydrogen. "If we use a 2- or 3-per-cent. solution of hydrochloric acid, a wall of lymph and granulation tissue is thrown out on the surface of the living bone for protection, and only dead bone is attacked." Michel-Danzac reports the rare complication of acute osteomyelitis following fracture of the pelvis. [55 Dec.26,'91]

Osteomalacia.—Hanau, of Zurich, [214 Aug.15] gives an interesting and exhaustive review of the pathology of this subject. He also reports the microscopical examination of a femur and a vertebra from a case of osteomalacia, and concludes that (1) the zones containing no lime-salts are due to a deposit of new material from the osteoblasts which cover them, and that (2) the cysts are of hæmorrhagic origin, and occur in the vicinity of former fractures.

The differential diagnosis between osteomalacia and multiple myeloid tumors, which, according to Kahler, of Vienna, [8 May 26] is at times most difficult, may be facilitated by remembering that albuminuria points almost conclusively to myeloid tumors. Sternberg [57 May 22] reports three cases of osteomalacia cured by the use of phosphorus (Phosphorus, 0.05; ol. jec. aselli, 100. Sig.: Two teaspoonfuls daily), and mentions another case which was greatly benefited. The only value possessed by cod-oil is that of a vehicle, unless it contains, as do some oils, small amounts of phosphorus. He highly recommends castration, saying it should be resorted to in recent cases with much narrowing of the pelvis, except when there is no danger of further conception, or when the patient is so reduced in strength, or has other severe diseases which would contra-indicate a laparotomy. In these cases, as also in senile osteomalacia, phosphorus should be used; it is also particularly useful in the puerperal form of the disease, preventing pelvic distortions. It is easy to confuse those cases of osteomalacia which have not yet caused deformities with diseases of joints, bones, or nerves, or with hysteria. More or less extensive articles have been published by Lamb, [61 Feb.13] Barsony, [57 Feb.14] and French. [105 Dec.15,'91]

Bone Syphilis.—Conner, of Cincinnati, [426 Mar.] states that luetic osteitis combines both rarefaction and condensation as does no other form. Syphilitic lesions of bones, in the absence of other specific lesions or their traces, are to be distinguished from the tubercular disease by (1) localization in the long bones, especially the tibia, and in the shaft above, rather than below, the epiphyseal line; (2) little or no joint involvement; (3) effects of treatment. Left to themselves, bone gummata, whether single or multiple, circumscribed or diffuse, never tend to recovery by resolution, but always to destruction. Davis [1 Jan. 23] publishes an extensively illustrated article on tardy hereditary syphilis of the bones. It differs from the ordinary hereditary form in that it appears much later in life,—in childhood, youth, or even early adolescence. Four cases are reported in which the disease manifested itself at the ages of 6, 7, 8 and 9 years, respectively. Fournier describes a case appearing at the age of 36 years. The eye is most frequently affected; the bones come next, about 38 per cent. The tibia, as in the four reported cases, is generally the seat of the trouble (see illustration), both periosteum and bone become affected. It is well to combine the antisyphilitic treatment with one adapted to strumous subjects.

SYPHILIS OF BONES.
(*New York Medical Journal.*)

Osteo-arthropathie Hypertrophiante Pneumique (Marie).—Gillet, of Paris, [62 Mar.] publishes an extensive article on this affection as it appears in children. He bases the following conclusions on four cases: 1. *Osteo-arthropathie hypertrophiante pneumique* may occur in childhood. 2. In children, the disease does not seem to involve a great number of bones. 3. The deformities may disappear. 4. The same causes may also produce, besides the deformities, arrest of development and trophic changes, sometimes directly, at other times indirectly, by action upon the organism as a whole. (The illustration represents the extremities of one of the reported cases.)

E. Bamberger [114 V.18; 151 Feb.] describes, besides the frequent thickening of the end phalanges, an alteration in the long bones, especially affecting the distal portions of the bones of the forearm and leg. These changes are due to an ossifying periostitis, the cause of which he would find in the absorption of the altered secretions in the lungs. Schmidt, of Munich, [34 Sep.26] considers syphilis a cause of osteo-arthropathie hypertrophiante pneumique; he bases his

OSTEO-ARTHROPATHY.
(*Annales de la Polyclinique de Paris.*)

opinion on a case observed by himself and one reported by Smirnoff, in both of which there was no disease of either lungs or heart. Orillard [92 Mar.; 2 Apr.30] describes a case of osteo-arthropathy of pulmonary origin (Marie), which apparently resulted from an injury to the chest.

More or less extensive articles have been published on this subject by Möbius, [34 June 7] and by Orillard. [100 June 25]

Lymphadenia Ossium.—Nothnagel, of Vienna, $\frac{57}{\text{Nov.15,'91}}$; $\frac{22}{\text{Dec.30,'91}}$ describes a peculiar and pernicious osseous disease, which seems to be entirely new, and which he christens "Lymphadenia Ossium." The patient was a young man with good family history. Nearly all the bones of the body were affected, especially the sternum and the bones of the extremities. The disease was intermittent, the paroxysms occurring at frequent and regular intervals, and being accompanied by pain, fever, and sweating. Several of the bones were thickened and swollen, and all were nearly devoid of marrow. There was slight enlargement of the spleen and lymphatics. Examination of the blood showed oligocythæmia and oligochromæmia. The affection differs from acromegalia, "osteo-arthropathie hypertrophiante pneumique," and osteitis deformans. The enlargement of the spleen and lymphatics would be explained, in the light of Mosler's experiments, by their assuming the blood-forming functions of the marrow of the bones.

Periostitis Albuminosa.—Dzierzawski $\frac{640}{\text{Nov.,Dec.,'91}}$; $\frac{6}{\text{Mar.12}}$; $\frac{673}{\text{July}}$ reviews the literature of this subject, and has collected twenty-eight cases, also describing a case of his own. He concludes that, in the majority of cases, the affection is a modification of purulent osteomyelitis. At times it is due to changes taking place in a tubercular abscess. Some indefinite cases have also been described which cannot be distinctly referred to either of the groups mentioned, but which are not characteristic enough to be in a group of their own. The mucus which is present in the exudation is due not to a degeneration of pus-corpuscles, but to the "dilution" of the mucus which is normally present in the periosteum. The affection is not a disease *sui generis*, but is comparable to those cases of osteomyelitis where a clear, fluid exudation is formed owing to the low type of the inflammation. John Berg $\frac{126}{\text{July 15}}$ also reviews the subject of periostitis albuminosa, and has collected twenty-nine cases, five being his own. In these five cases he found the staphylococcus pyogenes aureus and albus. He thinks that the subjects of the disease have a certain immunity, and hence the infection with pyogenic cocci is so much less intense than usual that only a serous or mucous effusion is produced. Mennen $\frac{336}{\text{June 25}}$ thinks, taking into consideration that osteitis albuminosa nearly always occurs near an epiphyseal line, that one is justified in assuming the disease to be in some way connected with the growth of the bone. He considers osteo-

myelitis and osteitis albuminosa as identical in origin, "this being, at times, shown by the presence of sequestra." The osteomyelitic exudation is subsequently transformed into the clear, yellowish fluid of osteitis albuminosa. On the other hand, pus-foci sometimes develop months after an operation for osteitis albuminosa; and further, Roser, of Berlin, describes a case in which on the one tibia an osteomyelitic abscess developed, and on the other a cavity, beneath the periosteum, filled with serum. Stephen Mackenzie, of London, [6 May 14] writes on periostitis as a sequela of enteric fever. He considers the affection rare; but not so rare as has been supposed. It usually occurs in young persons and upon the tibia, although it may appear upon the ribs, the sternum, or elsewhere. It most usually develops during convalescence, but may, at times, be seen during the course of the fever. Suppuration and necrosis generally, but not always, take place; the affection may even become chronic. Routier attributes it, in all cases, to injury; but if this were true it would probably complicate other kinds of exhausting fevers. The cause, as suggested by Sir James Paget, is more probably some morbid material remaining in the blood and affecting only certain tissues.

Exostoses, etc.—Those appearing during the period of growth are generally multiple, and seldom occur upon the bones of the head. Prengrueber, of Paris, [14 June 10] reports a case upon which he operated, where the frontal bone, in a girl of 22 years, bore an exostosis, which followed a contusion received at the age of 11 years. Reboul, of Marseilles, [46 Aug. 1] reports a case of the so-called "exostosis bursata" of the lower end of the femur, on which he had operated and was unable to find any communication between the bursa and the knee-joint. A case of hyperostosis, corresponding to the distribution of the trigeminal nerve, in a boy 15 years of age, is reported by Greig. [36 July] The abnormal growth of bone was first noticed at the age of 9 years. Alexander Thomson describes a skull presenting a similar anomaly, and refers to another seen by Jonathan Hutchinson. In a case mentioned by Shieck, the hyperostosis was limited to the area of distribution of the superior maxillary division of the trifacial, and was accompanied by a hypertrophy of the soft parts.

Myositis Ossificans.—Schmit [243 Feb.] reports another case of "rider's bone," occurring under the conditions which he has formulated

as promoting their development,—namely, muscular traumatism in a young subject yet in the period of growth. At the time of injury there was considerable pain, augmented by movement, but no swelling, no trace of a contusion, no subcutaneous effusion of blood, and no ecchymosis. Operative interference was not advised, because the capacity for working was but slightly affected, and particularly because the tumor involved important muscular insertions. Boppe [243 Feb.] has successfully operated upon two cases of muscular osteomata. The subjects were both soldiers. One of the tumors was a "rider's bone" situated in the upper part of the thigh; the other was near the elbow, and followed a contusion. Prior to this, but four of these operations had been reported. The author would find the exciting cause of these tumors to be the sudden efforts required of inexperienced cavalrymen in order to keep their seats in the saddle. Old cavalrymen, contrary to the general opinion, are rarely affected by "rider's bone." Reclus regards the affection as being due to repeated jars and continued pressure on the muscles. Virchow thinks that those who acquire these osteomata are predisposed to them before entering the cavalry service. Orlow thinks the cause is a tearing off of a piece of periosteum, with or without an attached piece of bone. Seydel says that the tumors are due to a transformation of clots of blood. The most rational treatment is extirpation of the growth under aseptic precautions. Extravasations of blood in parts subject to osteomata should receive careful attention,—compression, massage, puncture.

Osteosarcoma.—A case of multiple sarcoma of bone is described by Coats, of Glasgow, [213 Dec., '91] in which the tumors appeared in the sternum, vertebræ, humerus, clavicle, and femur. The author does not think that all of these tumors originated from a primary focus, but considers them of independent origin from a common cause. The foci in the vertebræ, he thought, were too regularly distributed to have been deposited from some primary tumor. Cancer often affects a number of bones, but sarcoma rarely does so. Heaton [2 Jan. 9] reports a case of myeloid sarcoma growing from the shaft of the radius in a boy.

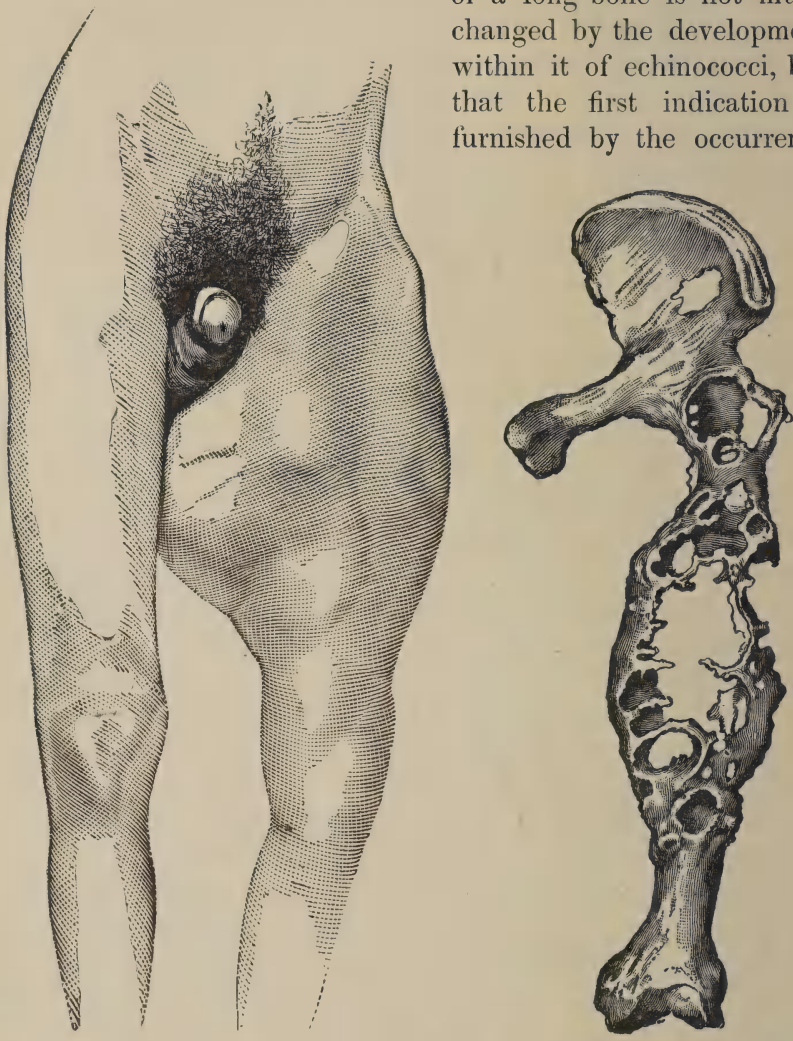
Enchondromata.—Mould [2 Jan. 2] records the removal of a small, partially ossified, cartilaginous tumor from the subcutaneous tissues of the lumbar region, near the spine. Subcutaneous, cartilagi-

nous tumors are said, by the writer, to be of very rare occurrence in any region. Steüdel, of Tübingen, $\frac{617}{V.8}$; $\frac{13}{Apr.15}$ describes a case of multiple enchondromata of the bones, with venous angiomata of the soft parts. The left arm and forearm alone were free of tumors. The entire left and part of the right half of the abdominal cavity were filled by an enormous tumor. The venous angiomata, which occurred in the colon and in the subcutaneous tissue of the affected extremities, were found, on section, to consist of a cavernous mass developed around, or to one side of, the veins. In the veins, as also in the meshes of the cavernous tumor, many phleboliths and thrombi were found.

Bone Atrophy.—The senile changes in bone and some senile diseases of the osseous system are described by Eve, of London. $\frac{2}{Dec.5,'91}$ He points out that, in the long bones, while there is a central atrophy of the cancellous structure, there is also some thickening of the periosteum, with bony deposit beneath it, giving the bones a roughened surface and sharper outlines. The calvarium, as a rule, is hypertrophied, especially upon the inner surface of the frontal bone, corresponding to the atrophy of the frontal lobes of the brain. The parietal bones are often affected by a curious and generally a symmetrical atrophy; deep, elliptical depressions are apt to occur on either side, between the parietal eminences and the sagittal suture. This is due to an absorption, by osteoporosis, of the outer table; and Sir G. Humphrey has conceived the ingenious idea that it may be due to "pressure of the occipito-frontalis tendon, stretched upon and playing over the most prominent part of the vertex." Hallion $\frac{152}{Nov.20}$ calls attention to the intimate relation existing between primitive myopathy and atrophic changes in the bones, with description of a case. The shaft of the bone may become reduced in volume and deformities are apt to occur. Fragility is increased, and fractures may easily take place.

Echinococcus.—Schnitzler, of Vienna, $\frac{57}{July\ 10}$ reports a case of this affection, occurring in the upper portion of the femur. It was first noticed at the age of 10 years, and continued until it caused the death of the patient at the age of 28 years. Locomotion was not very much interfered with. The patient had never been intimately associated with dogs. Some idea of the size and characteristics of the tumor may be obtained from the accompanying diagrams. (See illustrations, page 18.)

In 1889 Poppe collected sixty cases of bone echinococcus, of which eight affected the femur. The author's case makes the ninth on record. Von Bergmann has contended that the form of a long bone is not much changed by the development within it of echinococci, but that the first indication is furnished by the occurrence



A Case of Osteococcus.
(*Internationale klinische Rundschau.*)

of a spontaneous fracture. In the author's case, however, the changes in the bone were as marked as if caused by a neoplasm, and no fracture took place. The case described is, moreover, the only one in which the hip-joint was involved. The

disease may last as long as forty-five years (Virchow). Traumatism may either favor the localization of the disease or hasten its development when already localized. According to Poppe, out of 35 cases, 18 died (51 per cent.); and, according to Gangolphe, 20 died out of 40 cases (50 per cent.); the echinococci of the pelvic bones being particularly dangerous, but one case, which was operated upon early by Bardeleben, having survived. The only hope of cure is the early removal of the entire growth.

Webb [285 Nov.,'91] reports another case of echinococcus of the upper end of the femur. The patient, who was much reduced, improved markedly after incision of the tumor and evacuation of the contents.

Tumors Arising from Callus.—Much has been written on spontaneous fracture due to the presence, in the bones, of various tumors. The reverse condition of affairs, *i.e.*, tumors which develop at the seat of a fracture, is considered by Haberern, [226 V.43; 13 July 15] who reports a case of his own, and states that, of the 16 cases on record, 5 were sarcomata, 5 osteomata, and 6 enchondromata. The humerus and femur seem to be most often affected, and the length of time between the occurrence of the fracture and the appearance of the tumor varies between four or five months and twenty-one years.

Pseudarthrosis.—Faribault, of Montreal, [221 May] reviews this subject as occurring in the shaft of the femur. He gives, as the principal local causes, bad treatment, diseases of the bone at the seat of fracture, and obliquity or separation of the fragments.

Lead Poisoning.—An interesting case of lead poisoning from a bullet imbedded in bone is reported by Küster, of Marburg, and Lewin, of Berlin. [226 V.43; 13 July 15] After the bullet had remained for seventeen and one-half years in the head of the tibia, during which time the patient enjoyed good health, there appeared symptoms of chronic lead poisoning, anæmia, weakness, constipation, colic, and blue line on the gums. The urine contained lead, but no albumen. After the removal of the bullet, which was found to have been shattered into many small particles, the symptoms of lead poisoning slowly disappeared. But three other cases are on record, and in none of them was the interval of quiescence so long. Küster's explanation of the cause is as follows: The connective tissue which encapsulated the lead, for a long time poor in blood-vessels, was

gradually replaced by more vascular tissue, thus exposing the lead more directly to the blood-current. Absorption was also assisted by the fine subdivision of the bullet.

Osteo-arthropathy Due to Inoculation.—By inoculating rabbits with a culture of a micro-organism obtained from the inguinal glands of an individual affected with lupus of the leg, Dor [211 Apr.17] succeeded in producing, at the end of a year, a chronic, hypertrophic osteo-arthropathy, with enlargement of the lower end of the femur and upper end of the tibia, without embarrassment of movement in the joint. There was no fever and the general condition of the animals was good. The micro-organism was found to be a fine bacillus, and was named *bacillus aureus cereus.*

An article on the arrangement of the trabeculæ of cancellous bone is published by Hendriex. [868 June 25]

DISEASES OF JOINTS.

Tuberculosis.—Koenig, of Goettingen, [336 Aug.13] writes on the modern treatment of joint tuberculosis. He states that about half the cases are cured by physical means, and the results so obtained are better than those following resection. The injection of iodoform glycerin, which is especially useful in diffuse processes, causes about 30 per cent. to heal. For a number of cases the cleanest and safest radical operation is amputation. The typical operation, in grave cases of osteal joint tuberculosis, is resection with extirpation of the capsule.

Pawlowski, of Kiew, [3 Apr.6] from work done at the Pasteur Institute on inoculated joint tuberculosis, concludes that the cells of the connective tissue alone resist the infection. The leucocytes play a double rôle: (1) they struggle with the bacilli, and are either destroyed or form the epitheloid cells of the tubercles; (2) they act as carriers of infection to the general organism *via* the lymph-ways.

Manley, of New York, [19 Feb.20] writing of diseases which affect the hip-, knee-, and ankle- joints in children, strongly advises conservatism, and discountenances radical operations. He urges rest without absolute fixation, especially in bed, and the use of means to allay local inflammation.

Phthisis pulmonalis is claimed by Sorel [203 Feb.15] to run a particularly slow and mild course in individuals affected with articular tuberculosis.

Bingham [257 Aug.] lays down the following plan of treatment in tuberculosis of joints:—

1. In the early stage, *i.e.*, in the stage of so-called "growing pains," slight limp, and swelling, absolute rest to the joint, with tonic treatment and improved hygienic surroundings for the patient, is indicated, to be persevered with longer in the child than in the adult.

2. The moment caseation or retrograde change begins, a somewhat free incision, with erasion, should be made, if necessary and possible; but should the process have extended beyond the cancellous ends of the bones, immediate excision is indicated. Never remain satisfied with erasion unless absolutely positive you have got entirely beyond the disease.

3. If, on opening the joint, the disease be found confined to the synovial membrane, the less radical operation of aspiration is indicated.

4. If the disease be as yet confined to the end of the long bone and the joint not yet invaded, removal of dead bone and diseased products with the sharp spoon should be tried, with the hope of arresting the process; but should the destructive process still continue, excision is indicated.

5. In those joints where thorough erasion is impossible, excision would be indicated at that stage at which erasion would be done in such joints as the knee.

6. The early radical operation shortens the period of suffering.

7. Frequently, in case of the poor man, instead of the word excision in the above propositions we should read "amputation."

Mondan and Audry [91 No. 3; 126 July 15] arrive at the following conclusions regarding tuberculosis of the shoulder:—

1. In adults the bone is usually affected; ordinarily it is the humerus, although lesions of the scapula are not rare.

2. The epiphysis of the humerus, the most common seat of the disease, is usually affected in two places,—the head and the surgical neck.

3. The lesion may be central, but is usually cortical.

4. Two forms should be distinguished,—the one moist, of rapid development, and with or without fistulæ; the other dry, tending to atrophy and ankylosis, its development being slow and characterized by fixed and tenacious pains.

A thorough article on tuberculosis of the ankle is contributed by Huntington.[147 Jan.] Gibney, of New York,[451 Aug.] believes in the saying, "Leave caries of the ankle in children alone and it is bound to get well." The reverse holds true for adults. Sumarokow, of St. Petersburg,[21 July 25] states that ankle-joint tuberculosis, in persons of such an age that growth of the bones has ceased, should be operated upon early, an atypical subperiosteal resection being recommended, or the Wladimirow operation when there is extensive destruction of the plantar fascia. Amputation is advised when the general condition demands a rapid cure or when the bones are destroyed and the anterior part of the foot atrophied. Wilson,[760 Nov. 25] in an article on the closure of long-standing sinuses having their origin in tubercular joints, states that the dissecting out of the tuberculosis material may be facilitated by the injection into the sinuses of a solution of pyoktanin, which stains the tissues with which it comes in contact, and thus directs the operator. The removal of the infected tissues by clean incisions is advised, as the scraping and tearing only injures and reduces the vitality of the healthy parts. Bier, of Kiel,[336 No. 32; 9 Sept. 27] advocates the treatment of articular tuberculosis by passive hyperæmia, produced, after wrapping the joint well, by applying a rubber tube, protected by a soft bandage, above the joint. Over twenty cases so treated showed marked improvement.

Treatment.—More or less extensive articles on the treatment of articular tuberculosis by parenchymatous and intra-articular injections of iodoform glycerin have been published by Courrent[321 Nov. 15]; French[663 May 1]; Senn, of Chicago[96 Jan.]; Bryant, of New York[1 Feb. 20]; and von Bergmann, of Berlin.[336 Aug. 13] Böhni[214 May 1] advocates the use of ol. amygdal. dulcis instead of the glycerin, as with the oil a 5-percent. solution of the iodoform can be obtained. Blaizot, of Paris,[55 Aug. 6] states that the injections, even when unsuccessful, are of decided value, for, when practiced before an operation, they tend to prevent generalization of the tuberculosis. Krause[69 Mar. 3] thinks that the reason that iodoform fails to act on external tuberculosis, and yet has such marked effect upon tubercular joints and other internal foci, is because in the one the lesions are exposed to the oxygen of the air and in the other they are not; tubercle bacilli having greater resisting powers in the presence of oxygen. Hence one should seek to close all existing fistulæ.

Trendelenburg, of Bonn (reported by Arens), [761 Bd.3; 112 May] advocates the use of a 2-per-cent. emulsion in olive-oil. Drobnik [336 No.11; 1 Jan.30] also states that at times an amputation may be avoided, in cases where excision and arthrectomy are contra-indicated, by freely opening the joint and continuously plugging with iodoform gauze.

Good results are reported from the use of Lannelongue's chloride-of-zinc method by Chartrand [221 Dec.,'91]; Dubois [3 Apr.30; 26 Aug.]; Marchand and Quénu, of Paris.[3 May 25]

Joint Affections Peculiar to "Bleeders."—These are divided by Koenig, of Goettingen, [404 N.F.,No.36; 844 Sept.24] into three stages: 1. Stage of first hæmorrhage, or hæmarthrosis of the bleeders. 2. Stage of inflammation, or panarthritis. 3. Stage of regression and deformity. The second stage closely resembles the "hydrops fibrinosis tuberculosis" of the same joint. The deformities of the third stage lack the fistulæ and abscesses seen in tuberculosis. The diagnosis, at times most difficult or even impossible, depends upon the family history of hæmophilia, and upon the affection being most frequent in young males; again, the onset is usually sudden and the joint at first painless and its function unaffected. Fresh hæmorrhages may occur, causing the affection to advance by fits and starts. Subcutaneous ecchymoses support the diagnosis. Diagnosis is of importance, should an operation be contemplated. Treatment: rest, immobilization, compression, and aspiration. Piéchaud [188 Jan.10] also writes upon interarticular hæmorrhage, and Lucy [6 June 11] on hæmorrhages into bursæ.

Rheumatoid Arthritis.—Spender [2 Apr.30] regards rheumatic arthritis as "simply a grand neurosis, with arthritis as a collateral fact, and sometimes not at all the most important." Some of the extreme types of disorder which may be associated with it are:—

1. Rapidity of the pulse,—over 120.

2. Pigmentation of the skin. (*a*) A melasma resembling supra-renal discolorment. (*b*) Multiple xanthoma of advanced cases; this is very rare. (*c*) The coming and going of small areas resembling bruises on the limbs.

3. Atrophy of muscles and skin.

4. Neuralgia. This often precedes the joint trouble, and its significance is frequently overlooked.

5. Vasomotor derangements; the parts often steam with perspiration. This is a very valuable and characteristic symptom.

The writer concludes with the following propositions: (*a*) In its history and symptoms rheumatoid arthritis has distinctive notes of being under the dominion of the nervous system. (*b*) It may receive an initial impulse from rheumatism or gout, and possibly from other diathetic conditions. All causes of nerve depression and blood deterioration favor the rheumatoidal state. (*c*) When fully developed it is itself the cause of an "arthritic cachexia,"—to borrow an expressive phrase from Sir Dyce Duckworth. (*d*) This cachexia may be associated with profound lesions of nutrition with pain, with atrophy, with errors of inhibitive control, and even with visceral disease. (*e*) Amelioration and, perhaps, even cure are possible in the earliest stages; but, beyond a certain point, rheumatoid arthritis is as unmanageable as if it belonged to a malignant nosology.

Lane $_{\text{May 28}}^{2}$ says that, while "rheumatic arthritis" is an arthritis of rheumatic origin, "rheumatoidal arthritis" is a constitutional disease of debility, invariably having a history of phthisis or gout, or both.

Loose Bodies.—After excluding such rare causes as synovial apoplexy, masses of effused fibrin, tuberculous disease, and the like, Burghard $_{\text{May 14}}^{2}$ divides the pathological conditions giving rise to loose bodies in the knee-joint into: 1. Osteo-arthritis. 2. Direct detachment of articular cartilage by violence. 3. Changes in the synovial membrane not due to osteo-arthritis; these changes often arise from a more or less remote injury. Complete detachment of portions of cartilage is difficult of production, but partial detachments are of quite frequent occurrence.

Other articles are contributed by Southam $_{\text{Jan.2}}^{2}$ and Monks, $_{\text{Nov.19,'91}}^{9}$ the latter reporting the removal of some fragments of glass from the popliteal space, one piece of which projected into the knee-joint.

Purulent Arthritis.—Debove, of Paris, $_{\text{Dec.9,'91}}^{3}$ reports two cases of purulent arthritis in which no micro-organisms could be found, either by direct microscopical examination or by the culture method. Auvergniot, of Paris, $_{\text{Jan.16}}^{55}$ maintains that blennorrhagic mono-arthritis is as common in the female as in the male sex. A special predilection is shown for the right wrist.

Articles of more or less extent are published by Brackett $_{\text{Dec.10}}^{99}$ on atrophy in joint disease; Championnière, of Paris, $_{\text{Dec.,'91}}^{185}$ on the

hygiene and dietetics of the arthritic; by Lane, of London, $^{6}_{Jan.30}$ who would make a new division in chronic joint disease,—a "chronic traumatic arthritis" with distinct pathological and clinical characteristics.

Joint Syphilis.—Hutchinson, of London, $^{2}_{Apr.16}$ makes the following division of this affection: "1. Synovitis, during the secondary stage. This usually occurs within a few months of infection, is of but short duration, is very amenable to mercurial treatment, and clears off, leaving no trace behind. It is rarer and of far less importance than the other forms, which all occur during the tertiary stage. 2. Perisynovial gummata. 3. Arthritis due to osseous nodes or gummata in the neighborhood of the joint. 4. True chronic synovitis. 5. Syphilitic chondro-arthritis (Virchow)."

In the second stage or form, effusions into the bursæ or tendon sheaths are occasionally met with. Perisynovial gummata are more common in women than men, the tissues around the knee being particularly liable to be affected. It is a frequent and very chronic form. The third form is really comparatively rare, in spite of the fact that some authors incline to place all forms of syphilitic joint disease under this head. These osseous nodes have one diagnostic symptom, viz., severe nocturnal pains. The fourth form is the common form of syphilitic arthritis. To the above forms (5) the author adds two others, as occurring in hereditary syphilis: (6) syphilitic epiphysitis and (7) chronic effusion into the joints, usually the knee, and almost always associated with interstitial keratitis.

PLASTIC SURGERY.

Bones.—Bier, of Kiel, $^{169}_{July}$ has, in two cases of amputation of the leg low down, succeeded in forming useful artificial feet. The osteoplastic operation is complicated, and it is questionable whether its advantages are sufficient to counterbalance the difficulties. A section of the tibia, with its anterior surface removed, is cut away with the chisel and set at right angles to the bone above, the soft parts being securely sutured in this position. The difference in length of the two legs is remedied by an appropriate shoe.

Albert, of Vienna, $^{113}_{Sept.}$; $^{109}_{Sept.}$ offers the following suggestions with regard to amputation in the lower third of the forearm: "It is

proposed that, before division of the muscles, the tendons of the two radial extensors of the carpus, of the ulnar extensor, and of the two flexors of the carpus, be separated from their sheaths and the surrounding soft parts,—their attachments to their corresponding muscles being left intact,—and then divided as near as possible to their insertions. After division of the muscles and bones and arrest of all bleeding, canals are drilled obliquely through the ends of the divided radius and ulna, into each of which canals is inserted the free end of each of the above-mentioned tendons. In this way each tendon is made to acquire a firm attachment to its corresponding bone. After the wound has healed and the stump becomes quite sound, the author would endeavor to establish a freely-movable false joint, about a finger's breadth above the end of the two bones of the forearm, by resecting a portion of each.

Bier, of Kiel, $^{226}_{\text{Bd.43}}$; $^{13}_{\text{Aug.5}}$; $^{451}_{\text{July}}$ describes a modified sequestrotomy, as employed at Esmarch's clinic. The sequestrum is exposed by turning back the tissues which cover it, skin-periosteum and bone, in the form of a hinged flap, which is replaced when the cavity in the bone has been cleansed.

Bone-Grafting.—From fifty-nine experiments upon animals, Duplay and Cazin, of Paris, $^{55}_{\text{Aug.27}}$ conclude that the immediate repair of loss of bony tissue may be accomplished by filling the cavity with any material capable of being easily and rapidly invaded by the new-formed cells; they especially recommend sponge and gauze. The cavity in the bone and the implanted material must both be absolutely aseptic, and the wound be completely closed by sutures and iodoform collodion.

Dieuzaide, of Lectoure, $^{3}_{\text{Sept.21}}$ reports the successful application of Duplay's method, the cavity being in the upper end of the tibia, due to necrosis following comminuted fractures.

Baracz $^{336}_{\text{No.23}}$; $^{2}_{\text{July 16}}$ states that sections of the Swedish turnip form a reliable substitute for Senn's decalcified bone-plates.

Articles on the transplantation of decalcified bone have been published by Modlinski, of St. Petersburg, $^{21}_{\text{July 25}}$ who states that a scarcity of skin and soft parts renders the attempt useless; by Le Dentu, $^{100}_{\text{Dec.1,'91}}$ who reports having succeeded in replacing large defects in bones by the use of single pieces of decalcified animal bone. Articles on the use of live bone-grafts have been published by Buchanan, of Pittsburgh, $^{161}_{\text{Sept.}}$ and McGaw, of Detroit, $^{451}_{\text{July}}$ who

advocates the use of many small pieces taken from near the epiphyseal line; while Berger, of Paris, [22 May 25] reports the successful transplantation of a plate of bone taken from the scapula of a rabbit to the spinal column of a child, for spina bifida.

Tendons, Fasciæ, etc.—Viering [22 July 13] has determined that, in the union of divided tendons, the size of the cicatrix varies with the thickness of the intervening blood-clot. The new-formed tissue is found not to differ from true tendon, and the process is the more rapid the less the space between the divided ends.

Berger, of Paris, [3 Apr. 20] insists that success, in operations for contracture of the palmar fascia, depends upon the total extirpation of all the affected tissue. He reports a successful case in which, to more surely attain this end, he removed all the overlying skin, replacing the same by means of the modified Italian method of skin-grafting.

Muscular hernia is, according to Nimier, [243 Apr.] quite frequent, and should be treated by cutting down upon the protruding mass, reducing it, and suturing the opening with silk.

Skin-Grafting.—Morrow, of New York, [1 Dec. 12] has devised a new method, having a limited but valuable application. The grafts are cut from the entire thickness of the skin by means of a punch, and are then inserted into small holes prepared for them by the same instrument. The method is especially useful in transplanting hair-bearing skin to denuded areas of the scalp. Urban, of Leipzig, [301 V. 34; 13 July 15] reports the cases of skin-grafting according to the method of Thiersch, during the last five years at the Leipzig Clinic, —three hundred and ten in all,—including new growths, injuries, burns, plastic operations, nævi, contractures, necrosis, lupus, leg-ulcers, etc. He also, [301 V. 34; 13 July 15] as does Kramer, [336 V. 19, p. 8; 13 July 15] advocates the use and praises the result of the Thiersch method in the treatment of lupus.

More or less extensive articles on skin-grafting have been published by Parkham, of New Orleans, [12 Sept.] and Jalaguier, of Paris, [3 Mar. 16] who used the Italian method; Lop, of Paris, [17 Sept. 10] who reports the successful use of the frog for grafts; Freeman, of Cincinnati [426 Aug.]; Phocas, of Paris [100 May 12]; and Mixter, [99 Dec. 31] who describes several instruments which he has invented for the removal of the thin grafts of the Thiersch method. An editorial [80 July 15] says, of the Thiersch method, that "practically every solution of continuity

which is not amenable to direct suturing may be covered in at once by this procedure."

FRACTURES AND DISLOCATIONS.

By LEWIS A. STIMSON, M.D.,
NEW YORK.

FRACTURES.

Failure of Union.—A considerable number of articles have been written during the year on non-union after fracture, most of them being reports of cases treated by operation. D'Arcy Power, of London, [2 Dec.12,'91] has made a study of the condition as observed in children, on the basis of 63 cases collected by him; of these, 5 were of the clavicle, 9 of the humerus, 11 of the femur, and 38 of the leg; 25 males, 35 females. The results of treatment were very unsatisfactory; 6 were cured, 7 relieved, and in 36 no benefit was obtained. In the discussion that followed, Adams reported three cases that came under his own care, in children from 15 to 18 months old; the fractures were all at the junction of the middle and lower thirds of the femur, and all came to amputation. Several others reported similar cases.

In respect of treatment the only new method recorded is that of interstitial injections of a 10-per-cent. solution of chloride of zinc, an extension to failure of union of Lannelongue's "sclerogenic" treatment of tubercular disease of bones, glands, and joints. Ménard [91 p.407] reports a success obtained, five months after fracture of the leg, by the injection of 20 minims (1.3 grammes) between and around the ends of the fragments. Union was complete in a month. W. Moore, Melbourne, [285 Aug.15] referring to this method of treatment, says that glacial acetic acid had been similarly employed for several years past at the Melbourne Hospital, at the suggestion of T. N. Fitzgerald. In a case which he reports, "about 6 minims (0.4 gramme) of glacial acetic acid were injected in three places between the fragments. There was some swelling of the leg, but neither pain, redness, rise of temperature, nor disturbance of health."

The treatment of compound fracture, besides the usual reports of cases, has been made the subject of important papers by Mynter, of Buffalo, N. Y.,[2065] by Frey, of Gratz, [8 Mar.10 et seq.] and by Burrell and Dwight, of Boston. [99 Sept.8] Mynter reports eleven cases of compound fracture of the leg, some of them remarkable examples of preservation of the limb after extensive injury, and argues in favor of a more thorough carrying out of the principles and details of the treatment instituted fifteen years ago by Volkmann. He recommends free incisions, even if the wound is only a small puncture; the cutting away with scissors of all crushed or lacerated tissues; the slitting up of pockets and recesses; the cutting away of points of bone, sometimes even so as to leave square ends; disinfection with 1-to-2000 sublimate, and closing of all wounds and incisions with catgut. No drainage-tubes; no suturing of the bone.

Frey, on the other hand, seeks to restrict the amount of interference, and opposes the enlarging of wounds, the making of counter-incisions, and the cutting away of bone, except when such interference is clearly indicated. He reports 46 cases, of which 30 were simply disinfected and 16 were freely incised and trimmed. The results indicate a more prompt recovery under the former method. He attaches great importance to the free use of iodoform on the surface about the wound. Burrell and Dwight avoid incisions when the wound is small and not evidently infected, and lay especial weight upon absolute immobilization, preferably by plaster of Paris; the first dressing is changed in the second week, in order that any displacement that may have occurred may be corrected.

Gaudard [336 July 9] reports extensive use by Bucher of ivory pegs placed in the medullary canal to maintain fragments in position after compound fracture; 28 cases with 24 successes, although in some of the latter the pegs had subsequently to be extracted; 16 extractions in a total of 35 cases, including operations for failure of union.

Fracture of the Vertebræ.—Cases of operation (laminectomy) for the relief of symptoms due to fracture of the spinal column have been reported by McBurney, of New York [101 Dec.,'91]; Audry, of Lyons [211 Nov.8,'91]; Deaver [112 June] and Moullin, of London. [6 Feb.13] In McBurney's and Moullin's, the injury was of a lumbar vertebra, and the operation was done, five months in the former and nine weeks in the

latter, after the accident. It consisted in cutting away the spinous process and laminæ, and, in McBurney's case, of a portion of the body of the vertebra. Considerable improvement followed. In Deaver's case the injury was of the eighth and ninth thoracic vertebræ; after removal of the spinous process and laminæ of the ninth vertebra, the canal was found almost entirely occluded by the displacement of the body of the vertebra, and further proceedings were deemed useless. Recovery, without improvement. Audry's report is very brief; the fracture was of the fifth cervical, and he appears to have operated promptly after the accident. The patient died and the spinal cord was found to have been completely divided.

Hyoid Bone.—Scriber, of Detroit, $^{202}_{\text{Jan.}}$ presented a specimen of fracture of the hyoid bone found in the dissecting-room. The left cornu had been broken near its junction with the body of the bone and had united with angular displacement.

Pelvis.—Walther, of Paris, $^{7}_{\text{No.19,'91}}$ reports a hitherto undescribed variety of fracture produced by a blow upon the outer and lower surface of the tuberosity of the ischium; he had produced the fracture several times, experimentally, and thought he had met with one example clinically. The line of fracture passes from the great sciatic notch, across the cotyloid cavity, to the obturator foramen, and then across the ascending ramus of the ischium. Clinically, the fracture is indicated only by localized pain on pressure in the perineum against the ramus.

In the preceding number of the same journal, Walther describes an interesting collection of old fractures of the pelvis, and chiefly of the ilium, found in the dissecting-rooms in Paris. Six of them represent a series of fractures starting from just below the anterior superior spine of the ilium, and running backward and upward for variable distances. The fragments show a well-marked displacement downward.

Shipton $^{6}_{\text{Mar.26}}$ reports a case of fracture of the anterior inferior spine of the ilium, thought to have been caused by muscular action. The patient had fallen from a height of sixty feet, but showed no bruise over the seat of fracture. "A piece of the anterior edge of the right ilium, about one inch in length and three-quarters of an inch in breadth, comprising the anterior inferior spine with the origin of the short head of the rectus, was found to

be detached from the ilium to the extent of about a quarter of an inch, and could be easily moved between the fingers."

Clavicle.—Edward S. Stevens, Cincinnati, $\frac{9}{\text{Apr. 9}}$ describes an apparatus for the treatment of fracture of the clavicle, devised by the late I. L. Drake, but first put in use by Stevens. It is constructed on the old principle of a fixed support from the chest, as in the numerous "crutch methods," but it is distinctly superior to them in substituting retention by adhesive plasters for retention by a wooden or metal crutch. Three strips of adhesive plaster, a yard long and two inches wide, are applied to the front of the chest, below the clavicle, and spirally around the arm down to the elbow, so as to leave a short, free loop, corresponding to the outer point of the elbow. A metallic plate, five or six inches wide and about eight inches long, bent to fit the side of the chest, is fitted with a stiff wire loop running in a long curve upward and outward from one upper corner to the other, so that when the plate is applied to the side the wire loop will lie close around the shoulder, the arm having been passed through. A little behind the top of this wire loop is a small indentation in it, to prevent the slipping of the loop of adhesive plaster that is to be tied to it. The plate is made fast to the chest by a roller bandage and by a strip of adhesive plaster drawn through rings at its lower corners and then crossed over the opposite shoulder; the shoulder is then drawn upward and backward to correct displacement, and secured by fastening the loop of adhesive plaster to the top and back of the wire bow. Finally, the arm is secured to the metal plate by a strip of adhesive plaster previously placed between the latter and chest, and the wrist supported by a sling.

Fracture of the Anatomical Neck of the Humerus, with Dislocation of the Head.—Poirier $\frac{3}{\text{Sept. 22}}$ reports two cases treated successfully by removal of the head after attempts to reduce had failed. Webb, of Melbourne, $\frac{285}{\text{Oct., '91}}$ reports one in which a late excision of the head was followed by suppuration of the wound and finally by amputation.

Fracture of Shaft of Humerus; Musculo-Spiral Paralysis.—Murray, of New York, $\frac{1}{\text{June 25}}$ adds a personal case and nine others to those collected by von Bruns; in five of them an operation was followed by recovery of function. Stimson $\frac{1}{\text{Aug. 13}}$ reports a case of suture of the nerve in which return of function did not begin until a year after the operation.

Separation of the Upper Epiphysis of the Femur.—Bradford, of Boston, $^{99}_{\text{Mar.3}}$ reports three cases of this rare injury; one was seen in which the injury was recent, the others after the lapse of several months; the first made a good recovery without appreciable shortening; both the others limped in walking. Jon. Hutchinson writes an article on the same subject, $^{806}_{\text{Apr.}}$ but without adding any well-observed cases.

Fracture of Head of Femur.—Braun $^{226}_{\text{July 15}}$ reports a case of fracture of the head of the femur complicating a backward dislocation of the hip. The line of fracture ran from the insertion of the ligamentum teres downward to the attachment of the capsule.

Fracture of the Patella.—Some new methods of suturing or of holding the fragments together have been proposed during the year and some old ones re-invented. Barker, of London, $^{2}_{\text{Feb.27}}$ passes a silk ligature longitudinally beneath the bone, entering it through the ligamentum patellæ and bringing it out through the tendon of the quadriceps, and then between the skin and the patella to the point of entrance, where the knot is then tied and the ends cut short. Butcher, of Liverpool, $^{2}_{\text{Apr.30}}$ in ignorance that his plan has been extensively used in New York during the last four years, and reported in various journals and in the ANNUAL, proposes a subcutaneous silk suture passed through the ligamentum patellæ and the tendon of the quadriceps. Berger, of Paris, $^{3}_{\text{July 20}}$ has done the same in one case, using a silver wire. Aitken $^{2}_{\text{July 23}}$ passes a silver suture longitudinally through the fragments, according to Ceci's method, except that the wires do not cross each other. Kittredge, of Salem, Mass., $^{99}_{\text{Nov.19,'91}}$ fastens the fragments together by two wire rivets. Anderson, of London, $^{6}_{\text{July 2}}$ passes two stout pins transversely through the skin and the tough anterior fibrous envelope of the bone, and then, by pressure upon the projecting ends of the pins, draws the fragments together. It may be said, of the "subcutaneous" methods, that they expose to the chance of infection and suppuration almost, perhaps quite, as much as an open incision does. The writer, after an experience of about forty cases of subcutaneous silk suture through the ligament and tendon, has abandoned it, during the last year or two, in favor of the method of applying the same suture through a long, central, longitudinal incision, which makes the application of the suture easier and more accurate, and

allows the joint to be freed of blood and the lacerated fibrous tissues to be smoothed out and put in place. It has the great advantage, over the wire suture, of being much more easily and quickly done, of not interfering with the bone, and of not maintaining an open channel into the joint through which later infection, during repair, may occur in case suppuration takes place about the suture. In the Twenty-first Congress of German Surgeons, von Bergmann and König [69 Aug.11] again protested against the use of the suture in simple fracture. Fraser [9 Feb.20] reports a case of longitudinal fracture by a bullet.

Pott's Fracture at the Ankle.—Reports of operations for the correction of deformity after faulty union have been made by Haynes, of New York [1 Apr.11]; Gangolphe, of Lyons [211 Dec.6,'91]; Helferich, of Greifswald [34 Mar.22]; and Stimson, of New York. [1 June25] Two radically different methods were employed: in one the tibia and fibula were divided close above the malleoli and the foot pressed inward; in the other the original fractures were reproduced so far as possible, and the malleolar mortise re-established in its original form. Stimson, in addition, studies in detail the mechanism and pathology of the fracture.

DISLOCATIONS.

The Treatment of Old Unreduced Dislocations.—Thiéry, of Paris, [100 Nov.21,'91] gives a careful *résumé* and extensive bibliography of the various methods of operative treatment of old unreduced dislocations. He prefers an open arthrotomy, to be followed, if necessary, by resection, to subcutaneous division of bands and tendons.

Subluxations.—Eklund, of Stockholm, [996 July 10] reports on Berg's supposition of the unrecognized frequency of subluxations and of the mistake of supposing their pain to be rheumatic. Relief can be immediately given by appropriate manipulation.

Dislocation of the Seventh Costal Cartilage.—Aunis [70 Mar.13] reports a case of "dislocation of the right seventh costal cartilage from the eighth," caused by a fall. The lower border of the seventh cartilage projected under the skin; it could be reduced with a snap by pressure with the finger, but the displacement was readily reproduced.

Shoulder.—Hansson, of Warberg, Sweden, [336 p.18] reports a case of *luxatio erecta.* The patient, a woman 41 years old, was resting

her right forearm against a door-post above her head, when her foot slipped backward and she fell forward. When seen, the arm was directed upward at an angle of about 170 degrees with the mid-axillary line, the elbow as high as the forehead, the olecranon directed outward and backward; the forearm was directed inward and forward, and rested on the head. A notable swelling was visible in the axilla; the head of the humerus pressed against the third intercostal space. Reduction was easily effected, with the aid of anæsthesia, by drawing the arm upward and then pressing the head into place. Villar [26 Aug.] reports a dislocation in a child fifteen days old.

Paralysis After Dislocation of the Shoulder.—Müller, of Aachen, [336 p.611] reports an interesting case of paralysis of motion and sensation in the hand and forearm, coming on gradually after dislocation of the shoulder that had been easily reduced on the sixth day after it had taken place. Müller operated, seven months after the accident, by an incision in the axilla; he found the axillary artery and main nerve-trunks tightly compressed by a cicatricial band one centimetre wide. On division of the band, pulsation at once appeared in the brachial and radial arteries. Sensation and muscular function returned gradually.

Old Dislocation of Shoulder.—Pearce Gould and Cheyne, of London, [2 Feb.27] reported each one case of reduction by open incision. In Gould's case the dislocation had existed fourteen months; in Cheyne's, four months.

Recurrent Dislocation.—Dubrueilh, of Montpellier, [3 Feb.27] reports a case of recurrent (five times in twelve weeks) dislocation of the shoulder cured by six injections of two drops each of a 10-per-cent. solution of chloride of zinc into the periarticular tissues close by the capsule. The six injections were made in the course of a fortnight, and the patient was dismissed, apparently cured, a fortnight later.

Divergent Dislocation of the Elbow.—Vanheuverswyn [220 Sept.9] reports a case of this rare injury, produced by a fall. The olecranon passed up behind, the radius in front, of the humerus. Reduction was effected by traction and direct pressure, and complete recovery followed.

Dislocation of the Carpus Forward.—Dubar, of Lille, [100 July 28] reports a case of this injury, in a woman 70 years old, in which

the condition was verified by direct inspection, resection of the ends of the radius and ulna being done six weeks after the accident, because of inability to reduce. The external lateral ligament was torn, the internal lateral intact. No fracture at any point.

Hip.—Riedinger, of Würzburg, $\frac{34}{\text{Aug.16}}$ reports in detail a case of *perineal dislocation* of the hip and reprints eight other reported cases. Stimson, of New York, $\frac{1}{\text{Sept.8}}$ reports a case of *upward dislocation* of the hip.

Treatment of Old Unreduced Dislocation of the Hip.—Bartha $\frac{57}{\text{Feb.14}}$ reports a successful case of operative reduction of a four-month-old dislocation of the hip. Vantrin, of Nancy, $\frac{184}{\text{Feb.1}}$ reports a case in which he excised the head and neck of the femur, after failure to reduce; and Hughes $\frac{6}{\text{Jan.23}}$ a case of extreme suprapubic dislocation in which excision of the head and neck was done after an unexplained delay in treatment, which had allowed so much new bone to be formed by the stripped-up periosteum that reduction was impossible.

Congenital Dislocation of the Hip.—Lorenz $\frac{336}{\text{Aug.6}}$ describes an operative method of treatment which he has employed in four cases with satisfactory result. In brief, it consists in division, through one small incision, of the adductors and the muscles arising from the tuberosity of the ischium, while the limb is drawn forcibly downward. Then, through a transverse incision below the crest of the ilium, the sartorius, tensor, and rectus are divided, the capsule opened, and the acetabulum deepened.

Lannelongue, of Paris, $\frac{3}{\text{Dec.30,'91}}$ reports a case of congenital dislocation treated by the injection of about 20 drops of a 10-percent. solution of the chloride of zinc, at six or eight different points above the head of the femur; a firm ring of bone formed in consequence, and this was thickened by a repetition of the injection a fortnight later.

DISEASES OF ARTERIES AND VEINS.

By JOHN H. PACKARD, A.M., M.D.,
PHILADELPHIA.

ARTERIES.

Anomalies.—L. Testut, of Lyons, [2188] in his monograph on muscular anomalies, which are of importance to the surgeon, states that the large arteries which he has found to be occasionally covered by supernumerary muscular bands are the brachial, the axillary, the subclavian, the internal mammary, the popliteal, the posterior tibial, and the peroneal. He has met with no muscular anomalies which would affect the ligature of the carotids, the radial or ulnar, the iliacs, or the femoral or the anterior tibial, and has, therefore, left them out of consideration.

E. Reale [596 Nov.,'91 ; 2 Mar.26] records four cases of aneurism in which the amount of calcium salts passed in the urine was much greater than normal. He suggests that, should his observations be borne out in other cases, the fact to which he draws attention may be useful as an aid to the diagnosis of suspected aneurism.

Aneurism.—Turner, of London, [22 July 13] operated on a girl, aged 18 years, who had an aneurism by anastomosis occupying the right fronto-temporal region; it had been *in situ* since birth, but had considerably increased in size of late. He had previously operated on her about two months ago, when he had ligatured several main vessels round the tumor; this had the effect of stopping the bruit and thrill, and, for a time, also limited the amount of pulsation, though the size of the swelling did not diminish; about a month after the bruit returned to a slight extent. Turner then ligatured three large vessels which entered the tumor, two being just above the external angular process, the other just over the condyle of the lower jaw; they all three were dissected down upon and ligatured with catgut. There was immediately an evident diminution in the pulsation, and also in the size of the tumor. Meyer, of New York, [1 Aug.20] also reported a case. Having first tied the right external

carotid artery, he made an incision from the top to the bottom of the tumor. In spite of the ligature of the external carotid, however, the hæmorrhage was so severe as to require the use of Esmarch's bandage around the head, which at once stopped the hæmorrhage and rendered the rest of the operation easy. After the removal of the whole tumor and the ligation of all the vessels, the wound was closed and healed in ten days, under one dressing. In cases of this kind, Meyer says that the whole tumor might be removed, as in this patient; or that a large ellipsoid piece might be cut out of the mass of enlarged arteries,—of course, with the help of Esmarch's bandage,—and then all the divided vessels tied. The wound should be sutured and dressed before the elastic band is removed.

Internal Carotid.—G. Heaton, of Birmingham, $^{32}_{\text{Nov.,'91}}$ reports a case of false aneurism of the internal carotid, in which death from hæmorrhage occurred, following rupture of the aneurismal sac. Walter Edmunds, of London, $^{2}_{\text{May 7}}$ showed a specimen before the London Pathological Society, taken from the body of a man aged 36 years, of an aneurism of the left subclavian, and narrowing of other arteries. Heiberg, of Christiania, $^{3}_{\text{July 27}}$ insisted upon the importance of syphilitic arterio-sclerosis in the production of aneurisms. In twenty-eight cases he found that syphilis existed in twelve, or almost half.

Common Carotid.—Speaking of the cerebral softening following ligation of the common carotid, Lampiasi, of Trapani, $^{3}_{\text{Nov.11,'91}}$ admits neither the theory of aneurism supported by Richet and Ehrmann, nor that of thrombosis, sustained by Le Fort. He concludes that it is due to embolus, mainly caused by the arrest of the blood-current. He therefore suggests that, besides the trunk of the common carotid, the internal carotid should also be ligated, in order to prevent the return current, which takes place from the internal to the external carotid. Slowing of the current is thus avoided and the formation of the clot at the seat of ligation prevented. Turner, of London, $^{6}_{\text{June 25}}$ obtained a successful result by ligation in a case of very large aneurism of the common carotid, probably of traumatic origin, judging from its rapid growth.

Friedrich von Korányi reports a case of complete occlusion of the left carotid by a thrombus. A woman of 51 years had an attack of apoplexy, with loss of consciousness. Ten days later

the pulse of the two radials was found to be very small, and the beating of the right carotid very feeble, while there was no pulsation in the left carotid. The heart was normal, there was a systolic bruit over the aorta, and percussion over the upper part of the manubrium sterni gave a muffled sound. Aneurism of the arch of the aorta was suspected. Three days later the pulsations appeared in the left carotid. A diagnosis was made of endarteritis of the aorta and carotids, with the formation of a thrombus in the left carotid, which later *s'est canalisé*.

Karewski [69 Jan.14] operated for an aneurism of the right common carotid artery in a man whose general health was perfect. There was a tumefaction of the neck between the hyoid bone and the mastoid apophysis. There was no pulsation or fluctuation, but the tumor was compressible, and the pulse was isochronous in the two temporals, but there was no fever. The diagnosis lay between blood-cyst and aneurism. Central and peripheral ligatures were employed in the operation.

Innominate.—R. S. Thomson, of Glasgow, [213 Dec.,'91] reported an unsuccessful result in a case of aneurism of the innominate artery treated by Macewen's method. The pathological specimen showed evidence, however, of the great advantage of the operation, the thrombus being much greater than could have been expected during the five days the patient lived after the operation. Cases of aneurism in this region are reported by A. Köhler, of Berlin, [41 June 30] and Mackellar, of London. [22 Mar.2] A case of tubular aneurism of the high innominate artery was described by Clegg, of Liverpool. Caselli, of Genoa, [3 Nov.11,'91] reported a successful result in a case of aneurism of the brachiocephalic tract treated by Macewen's method.

Carotid and Subclavian.—Mackellar, of London, [6 Feb.27] ligatured simultaneously the carotid and subclavian arteries in a case of probable innominate aneurism. A special point in the case is that the patient had undergone ligature of the superficial femoral artery on each side for popliteal aneurisms. The first operation was performed more than four years ago, the second about two and a half years since, and he carried on his duty as a constable until the appearance of the aneurism for which he is now under care. Up to the present progress has been most satisfactory; the aneurismal swelling is diminished in size, and the pulsation is considerably less.

In a case of the same kind, Abbe, of New York, $^{1}_{July\ 2}$ tied the carotid above the omohyoid, and the subclavian in its third portion. Twisted-silk ligatures were used, and the specimen showed how well they had been buried in the plastic exudate. On the sixth day after the operation high temperature and pericarditis set in, and the patient died two days later. At the post-mortem examination an extreme atheromatous condition of the aorta and a symmetrical dilatation of its wall, without a distinct aneurism, were found. An interesting case of simultaneous ligature of the carotid and subclavian arteries, for aneurism at the root of the neck, is described by Markoe, of New York. $^{1}_{Aug.20}$ No improvement occurred, and the visible portion of the tumor was very slowly increasing in size when the case was reported.

Subclavian.—J. D. Bryant, of New York, $^{234}_{Jan.}$ draws the following conclusions: "The lease of life gained by the so-called medical treatment of subclavian aneurism emphatically teaches that its employment should precede all other methods. The lease of life following distal ligature of the subclavian and carotid arteries, for the cure of aneurism of the first two portions of the subclavian, cannot as yet be estimated, because of the paucity of these cases that have an undoubted diagnosis. The lease of life following ligature of the innominate alone, for subclavian aneurism, does not justify the operation; but ligature of the innominate, when supplemented with simultaneous and consecutive ligature of the associated contiguous arteries, or by other expedients equally well intended to aid the cure, is worthy of favorable consideration. The lease of life gained by the pin-irritation method of Macewen, and galvano-puncture with its associated treatment, warrants a strong belief in the special benefits of these expedients, when employed singly or with ligaturing."

R. J. Godlee, of London, $^{2}_{Apr.16}$ related the case of a man, aged 66 years, with a large axillary aneurism on the left side, with dilatation of the left subclavian and signs of pressure on the brachial plexus. Tufnell's treatment was employed for three weeks without effect, and the aneurism appeared to be increasing. The subclavian was accordingly tied in its second part with catgut. The wound healed by first intention, and the aneurism was stated to be contracting gradually.

Halsted, of Baltimore, $^{764}_{July,Aug.}$ successfully performed ligation of

the first portion of the left subclavian artery and excision of a large subclavio-axillary aneurism. This case is, perhaps, the only successful one of deligation of the first part of either subclavian artery, and the first one of complete extirpation of a subclavio-axillary aneurism.

Aorta.—Robert F. Weir and Emmett D. Page[1, May 7] treated a case of aneurism of the ascending aorta by means of Macewen's needles, inducing a white thrombus. The patient had previously been in good general health, was of excitable temperament, and 47 years of age. The symptoms—pain in right arm and side of chest, and pulsations of heart—dated back some six or eight months. The tumor had appeared four weeks previously. A needle was thrust into the most projecting portion of the mass and left *in situ* for eighty minutes. A second one was left in place for fifty minutes. A week later four needles were introduced, and a week later four more. The operation was followed by no improvement, and the patient died a couple of months later.

Villar, of Bordeaux,[188, July 3] performed temporary ligature of the thoracic aorta in a case of aneurism of the arch. The aneurism was a classical one, and incision was made in the dorsal region on the left side, between the omoplate and the spinous apophyses, and a second incision perpendicular to the first, directed from without. Denudation of both sides, and section of one, caused perforation of the pleura. The aneurism was easily found, the pouch being quite large. The author had intended to tie the aorta, but contented himself by compressing it against the vertebral column. Antiseptic dressings were applied. The patient did well during the day, but died in the evening.

Thomas Oliver, of Newcastle-on-Tyne,[6, May 14] writes an article on dissecting aneurisms of the thoracic aorta, abdominal, innominate trunk, and iliac arteries. The word dissecting is intended to convey an idea of the relationship of the tumor to the three arterial walls of the vessel. A rupture taking place in the innermost wall, the blood penetrates into the opening, and gradually pushes out the remaining coats, so that it seems at times as if a vessel in which there was an aneurism contains within it another blood-vessel. This is illustrated by a case of the author's, in which the aorta included a smaller aorta within itself, composed of internal and middle layers of the normal wall of that vessel, throughout almost its whole extent.

Coronary.—Zoege von Manteuffel, of Dorpat, [21 Mar.7] operated on a man of 39 years, who, while delirious, attempted suicide, inflicting a severe wound of the artery and coronary vein of the right ventricle. Laparotomy was performed, and the seat of hæmorrhage found with difficulty. The operation was long and difficult, but the patient recovered. He died five months later, of tuberculosis of the tongue. The central part of the coronary artery was then examined and the ligature found in position.

Descending Aorta.—Bourget [197 No.5 ; 80 July] operated upon a patient suffering from aneurism of the descending aorta in accordance with Bacelli's method. The patient suffered for some time with intermittent cough and intercostal pains. The latter became constant, and the tumor developed posteriorly just below the posterior angle of the scapula. This tumor offered all the characteristics of aneurism, and gave clear blood on puncture. A watch-spring one-third of a yard long was introduced into the aneurismal sac, after having been previously sterilized and roughened by immersion in hydrochloric acid. As a result of this treatment the tumor decreased in size, intercostal pains disappeared, and the patient rapidly gained in weight. A month after this operation exploratory puncture was made, but no fluid blood could be obtained.

V. E. Lawrence, of Halstead, Kan., [186 Sept.] adds practical testimony to the value of iodide of potassium in aneurism of the abdominal aorta. Ishikawa, of Tokio, [200 Feb.] also reported a case of aneurism of the abdominal aorta, and took occasion to insist on its efficaciousness. Cases of abdominal aneurism ending by rupture are described by Macadam Wallace, of Liverpool, [187 July] and by Museler, of Paris. [55 May 28] E. V. Eames [6 Nov.14] reports a case of rupture of the kidney and traumatic aneurism of the abdominal aorta, the result of a fall from a bicycle.

Iliac.—An interesting case of false iliac aneurism, in which the tumor was incised with a fatal result, is recorded by Bradford, of Boston, [22 Dec.30,'91] the patient being a previously healthy man who, after a severe strain, suffered a good deal from pain in the right groin, where a hard indurated swelling, without fluctuation or pulsation, developed. On being cut into, the muscles were found very much congested, and when the peritoneum, which was darker than usual, was divided, clotted blood escaped ; a large clot was pressed out, its removal being followed by considerable hæmorrhage

from a jet as large as the radial. All attempts to tie the bleeding point failed, and the flow of blood was arrested by means of pressure-forceps and abdominal compression. By dissecting above and below attempts were further made to stay the loss of blood, but they all failed, and death occurred about four hours after the operation. Post-mortem it was found that a true aneurism existed on the common femoral, three-quarters of an inch below the bifurcation of the aorta, the internal iliac vessel coming off from the sac of the tumor. A large false aneurism had resulted from rupture of the latter, and the clot presenting in the inguinal region had given the appearance of an inflammatory product, which had proved so deceptive. The failure to arrest the hæmorrhage by ligature arose from the fact that the bleeding-point was in the sac of the aneurism and not in the wall of an artery, and extended toward the aorta, out of reach of surgical interference. A successful ligature of the iliac artery for gluteal aneurism is reported by L. L. Williams, of the United States Marine-Hospital Service. $\frac{1}{\text{Aug.20}}$ Thornley Stoker, of Dublin, $\frac{16}{\text{Mar.}}$ obtained a favorable result with a combination of Valsalva and Tufnell's treatment in a case of aneurism of the external iliac.

Femoral.—H. Marsh $\frac{2}{\text{May 13}}$ described a case of spontaneous cure of an aneurism of the femoral artery apparently by inflammatory action. In a case of aneurism of the superficial femoral artery, Watson Cheyne $\frac{2}{\text{Feb.6}}$ cut into the aneurism, ligated the femoral above and below the opening in the vessel, and removed the greater part of the sac. Recovery ensued. A cure by digital pressure is reported by F. P. Lansdown, of Bristol. $\frac{2}{\text{Sept.17}}$ W. Thorburn $\frac{2}{\text{Mar.26}}$ reported a successful case of treatment of a ruptured femoral aneurism by the "method of Antyllus." A man aged 27 had developed an aneurism at the commencement of his left popliteal artery, in consequence, probably, of injury inflicted by resting the hoof against his thigh in his occupation of shoeing horses. The aneurism had ruptured, and was suppurating. The incision was carried into the blood-containing cavity, the vessel doubly ligatured, and a good recovery ensued.

Idzinski, of Cracow, $\frac{41}{\text{Aug.22}}; \frac{84}{\text{No.14,15}}$ reports a case of simultaneous ligature and resection of the artery and femoral vein beyond the deep branches. A man of 37 years was affected with carcinoma of the penis in 1892; it was extirpated, together with the inguinal

ganglia. The two vessels were found to be degenerated for a space of three centimetres. The vessels were separated from the neoplasm, but two months later the patient presented a swelling in the inguinal region. The affected portions were resected. Œdema followed, and the pulse on the side operated on was much weaker than on the other. This symptom remained after all others passed away and the patient recovered.

Popliteal.—Meinhard Schmidt, of Cuxhaven, [336 Aug.13] reports the extirpation of an aneurism of the popliteal artery. A healthy man of 36 experienced some discomfort in the popliteal space, and on examination two pulsatile tumors were found. There were no unusual phenomena in the circulation of the members, but the pulse revealed arhythmia. The left aneurism was first extirpated. It was of a cylindrical form, and about two fingers' breadth in thickness. Having tried vainly to compress the right femoral artery, the other aneurism was also extirpated. Recovery was complete.

Kubler [761 B.9,H.1; 2 May 28] reports three cases in which Professor Bruns, of Tübingen, performed extirpation of an aneurismal sac. The first case was one of a large popliteal aneurism in a patient aged 56. The other two were cases of traumatic aneurism of the brachial artery. In each of these cases total extirpation of the sac was followed by speedy and complete recovery. It is strongly advocated by Kubler as being the best method of treating aneurism of a limb. He has collected 40 cases from different sources, the results of which certainly go far to confirm this opinion. Twenty-eight of those were cases of arterial aneurism, and in the remaining 12 both artery and vein were involved in the swelling. The aneurism was non-traumatic in 11 cases, and the result of injury in 29 cases. In 18 cases it was seated in one of the lower and in 16 in one of the upper limbs. In 39 of these cases, 3 of which were treated before the era of antiseptic surgery, the operation was completely successful. In each of the 3 cases treated by Bruns the sac was dissected away *in toto*, and unopened, the vessels on the proximal side having been previously tied and divided. In not one of the cases collected by Kubler was any mention made either of secondary hæmorrhage or of gangrene. Extirpation of the sac in the treatment of peripheral aneurism is held to be the most rational and certain and the least dangerous

method. The undoubted difficulty of this operation ought not, the author urges, to be considered a serious objection in these days of anæsthetics, bloodless methods, and perfected antisepsis.

G. H. Cummings [99 July 21] reports a case successfully treated by ligation of the femoral, in Hunter's canal, after ineffectual treatment by compression. A case of cure by the latter method is described by J. W. White, of Philadelphia. [112 Mar.] D. Benjamin, of Camden, [121 Jan.] ligated the femoral artery and vein in the lower part of Scarpa's triangle, after failing to obtain a favorable result with the compression method, and obtained a complete recovery.

Dorsalis Pedis.—W. Thorburn, of Manchester, [2 Nov. 28, '91] reported a case of aneurism of the dorsalis pedis artery in which he completely dissected and removed the growth, obtaining recovery. Aneurism of the dorsalis pedis artery is so rare, says the author, that Delorme, writing in 1879, was able to collect only fourteen cases. The cause has generally been an injury,—either a wound, a bruise, or overstrain of some of the tarsal joints, which almost necessarily injures the vessel. In the present case no cause whatever could be assigned, but the connection with symptoms of locomotor ataxy, from which the patient was suffering, may account for an extra risk of injury to the foot.

ARTERIO-VENOUS DISORDERS.

Arterio-Venous Aneurism; Ligature of the Common Carotid and Internal Jugular.—Keen, of Philadelphia, [5 June; 2 July 23] has reported an interesting case of arterio-venous aneurism. A boy aged 16 years was stabbed with a pocket-knife on the right side of the neck. The injury was followed at once by profuse bleeding, which was arrested by direct pressure. No attempt was made to ligature the vessels, and the pulsating tumor which soon made its appearance was treated by the continued pressure of a bag of shot. The patient, when first seen by the author, about three months and a half from the date of injury, presented a well-marked arterio-venous aneurism. There was a small scar at the site of the stab, on a level with the lower border of the thyroid cartilage. The sterno-mastoid was so thin that apparently only skin and fascia covered the swelling. There was visible pulsation over an area of three inches on the vertical and two inches in the transverse direction. There was a distinct thrill over a large area, and

with the stethoscope a rasping bruit could be heard, which extended from the site of the aneurism over the entire circumference of the neck, the whole of the head, and the anterior portion of the chest, down the back as far as the lumbar region, and along the right upper extremity, from the axilla to the elbow. An incision four inches in length was made from the sterno-clavicular articulation, just above the clavicle, and another incision, starting from the same point, was made along the inner border of the sterno-mastoid muscle, which was cut through near its sternal and clavicular attachments, and lifted up with the flap of skin. After a tedious dissection, the carotid artery and the internal jugular vein were isolated and tied below the tumor. The vein was found to be much distended in this portion of the neck, whilst the artery was normal in size and appearance. A dissection was made in the upper part of the neck, where, at a point a little below the angle of the jaw, the vein suddenly narrowed to nearly its ordinary diameter. The vein at this point was secured by a silk ligature, and the carotid was afterward secured just below its bifurcation. The sac was laid open, but, as its adhesions to the surrounding soft parts were firm and extensive, it was thought prudent not to attempt its removal. The entire operation lasted a little over two hours. The patient made a very good recovery, and was able to leave his bed and to move about on the eighteenth day. Keen states that, though sharing the opinion that it would be advisable, in most cases of aneurismal swelling in which the internal jugular is involved, not to operate, the result in this case proved the wisdom of operating, since the patient has been relieved of an aneurism, which not only caused much deformity and discomfort, but might have ruptured and caused speedy death.

E. Lévy, $\frac{243}{\text{Apr.}}$ in a case of arterio-venous aneurism of the thigh, opened the sac and ligated it, obtaining a recovery. In a case of the same kind seen by McBurney, of New York, $\frac{1}{\text{Mar.23}}$ the tumor was cut down upon, and found to be purely venous and evidently caused by a communication between the artery and vein. The artery was tied above and below, the pedicle of the tumor ligated, and the tumor successfully removed.

Recovery was obtained in a case of arterio-venous aneurism of the left peroneal artery operated upon by Faguet, of Bordeaux. $\frac{3}{\text{Apr.7}}$ He ligated the posterior tibial artery and vein and the peroneal

artery and vein, then extirpated the sac. Briggs, of Nashville, [120 Apr.] reports a case of arterio-venous aneurism of the brachial artery in which ligation above and below the aneurism procured a cure.

To the ten or twelve cases of arterio-venous aneurism of the axilla so far reported, Tavenard, of Paris, [55 May 21] added that of a soldier in whom the aneurism had only shown itself nineteen years after the lance-thrust, which was its remote cause, had been received. Extirpation of the sac and ligature were practiced with success.

VENOUS DISORDERS.

Obliteration.—Comby, of Paris, [14 Jan. 10] describes a case of obliteration of the superior vena cava. The patient was a man of 36 years, with a history of typhoid fever, pneumonia, and syphilis; for eighteen months he had been affected with attacks of palpitation, precordial constriction, and visual disturbance, these attacks becoming more frequent from day to day. The face became congested easily, and there was a sensation of permanent constriction in the throat. There was difficulty in breathing, headache, and dyspnœa. The development of the upper portion of the body contrasted with that of the lower part, which was thin. The neck was large and more swollen on the right than on the left side. The upper extremities were hard and œdematous, especially on the left side. The viscera were normal, the cardiac beats frequent (120 to 130), and there was a systolic murmur on the level of the second right intercostal space, and dullness on the edge of the sternum. The case was found to be one of obliteration of the superior vena cava, probably by a tumor. No treatment was attempted, and the prognosis was grave.

Air in the Vein.—Edward Martin, of Philadelphia, [99 July 7] basing his statement upon experimental work on dogs and monkeys, finds it impossible to have animals aspirate air into the veins. Owing to the vein-walls collapsing, it was impossible to have air sucked in, in the case of a dog, even when the jugular vein was opened and a vacuum created in the chest, providing the vein was not hardened by disease or artificially kept open. A few bubbles of air did no harm. With the monkey the result was different, causing death in about half an hour after the air was aspirated, while with the human subject the aspiration of air was one of the most disastrous accidents that could happen. He once wounded

the axillary vein, and thought he heard two or three suction sounds, but, as no evil results followed, he was convinced that it was due to air in the tissues, and not in the vein. As to treatment, nothing has been added to the suggestions contained in the writings of Senn. The treatment is simply mechanically controlling the circulation from the wound to the heart.

Wounds of Veins.—E. Martin, of Philadelphia, [112 Dec.,'91] published a statistical study of wounds of the femoral vein, supplementing his article with tables giving the results in one hundred and twenty-six cases found in the literature of the subject, and arranged in accordance with the individual portions of the vein wounded. The following conclusions are presented:—

1. The femoral vein is not the channel by which the blood of the leg may reach the pelvis. 2. For the establishment of collateral circulation, venous pressure, equal to that which is found in the arteries, is often requisite. 3. Wounds of the femoral vein inflicted by the surgeon in extirpation of tumors will not be followed by gangrene if the vein only is ligated. All wounds, however, become more serious in proportion to their proximity to Poupart's ligament. 4. Wounds of the femoral vein inflicted in tumor operations are liable to be followed by gangrene if vein and artery are both ligated. 5. Wounds of the femoral vein inflicted by weapons or sudden violence, and where the surrounding parts are previously healthy, are frequently followed by gangrene, even though the vein alone be ligated. This complication is rendered more probable by ligating both vein and artery. 6. The treatment of hæmorrhage from the femoral vein by ligature of the femoral artery should not be practiced. 7. Lateral closure of vein wounds, where possible, is to be preferred to all other means of treatment. If the lateral ligature is employed, it must be of fine silk, and the thigh must be flexed until it is vertical to the plane of the body. Suture is to be preferred in this region; and in case both these methods are unsuccessful, forceps should be tried before the surgeon resorts to circular ligation. The forceps should be removed in forty-eight hours, the wound being carefully packed in the meantime. Where the suture is employed it should be catgut, and continuous, and should bring intima to intima. Over the first line of suture the sheath of the vessel should be sewed to give additional support. 8. The treatment of

injuries to the femoral vein by closure of the external wound and the application of pressure is not to be recommended, since the blood-pressure in this vessel is higher than in other veins. (Ollier records one success from this method.) To this statement the author makes an exception. When the femoral vein is wounded with a ball of small calibre, the hæmorrhage is not necessarily marked or continuous. Antiseptic dressing and firm compression may, in this case, either allow the vein wounds to heal entirely, or may, if the artery be also wounded, favor the occurrence of an arterio-venous aneurism, operation upon which will subsequently be far safer than ligature of the femoral artery and veins at the time of injury. 9. Where the vein is ligated, the foot and leg should be held in vertical suspension, since this greatly aids in overcoming the resistance of the valves, which normally prevent collateral circulation. 10. The maintenance of asepticism and the support of the entire limb by careful bandaging are both requisite for the treatment of femoral-vein injuries.

Körting [495 B.3] describes a case of punctured wound of the external and internal jugular vein measuring four centimetres in the centre of the sterno-mastoid. The profuse hæmorrhage was arrested by means of tampons. A double ligature of the vessels was performed, with excision of the wounded part, three centimetres in length. Recovery followed in eight days.

Phlebitis.—A case of phlebitis and thrombosis of the saphenous vein, followed by aphasia and death, is reported by John Hunter, of Toronto. [39 Nov.16,'91] Dauriac, of Bordeaux, [100 Jan.26] mentions a case of influenza in which phlebitis presented itself toward the end of that disease's course, as is the case when it occurs as a complication in typhoid fever, puerperal and other infectious disorders. In a case reported by G. F. Shiels, of San Francisco, [77 Feb.] an acute phlebitis completely cured a varicose condition of the leg, which had been of sufficient importance to necessitate the use of an elastic stocking. The patient, a physician, had continued his labors notwithstanding the intense pain produced by the inflamed vein, thus encouraging the curative inflammatory process.

Vaquez, of Paris, [7 June] describes a case of non-obliterative phlebitis in a patient far advanced in tuberculosis. There was a slight perimalleolar œdema, especially on the left side. Some days later there were shooting pains in the leg and thigh on the same side,

but the œdema did not increase. The patient had suffered from the pain before his entrance into the hospital, and soon succumbed. At the autopsy the following lesions were found: The popliteal vein was filled by a blood-clot, which almost completely occluded it, and which measured from six to eight centimetres. Its union with the vein was very close, and the rest of the vessel showed marked thickening. The vaso-vasorum was obliterated. The patient was, therefore, affected by phlebitis, without presenting the clinical picture of phlegmasia alba dolens. Vaquez, of Paris, $\frac{3}{\text{Dec.23,'91}}$ believes that phlegmasia alba dolens is but the second stage of a complication of infectious nature. The first stage, from a clinical point of view, is characterized by pain, elevation of temperature, and transitory œdema, the latter being especially prominent in cases in which the pain is so acute as to be called neuralgic; from an anatomical stand-point, by the formation of an endophlebitic swelling; from a bacteriological stand-point, by the detection of the infectious agent, which most often is the staphylococcus.

Max Schede, of Hamburg, $\frac{301}{\text{B.43,H.3,4}}$ states that sutures of the veins present many more advantages over other methods, above all in cases of extirpation of degenerated ganglia, tuberculous or cancerous. Hagedorn's needle and very fine catgut should be used. He reports a case of suture of the inferior vena cava, in which the neoplasm had encroached upon the vessel-walls, rendering this procedure necessary.

Langermann, of Hagenau, $\frac{41}{\text{Sept.19}}$ describes a case of ligature and resection of the femoral vein below Poupart's ligament, with recovery. The patient was 55 years old, and was operated on for cancer of the labia majora. Recurrence ensued, and cancerous formations were found on the internal saphenous vein and the femoral. Ligature and resection of the affected portions were followed by recovery. Microscopic examination showed carcinomatous degeneration of the walls, with constriction of the lumen of the vessels.

Niebergall, of Marburg, $\frac{301}{\text{B.33,H.6}}$ discusses the different methods of treating injuries of the larger veins. He considers antiseptic compression and lateral ligature suitable in injuries of limited extent. Suture of the vein is safer, preventing any hæmorrhage. Lateral compression by means of forceps is also recommended, the forceps to be removed in twenty-four hours.

Varices.—Prawdoljubow [101 Aug.] has treated a number of cases by Trendelenburg's method, which consists of the excision of a piece of the great saphena vein after previous double ligation. He employed this treatment in 3 cases of varices, 8 cases of varicose ulcer of the leg, and 1 case of hæmorrhage from a ruptured varix. The operation was performed under cocaine anæsthesia, and the wounds healed by first intention. The results were excellent. In 8 cases the varices disappeared completely; in 4 cases they were scarcely noticeable. The pains and feeling of weight in the extremities were entirely relieved, the ulcers cicatrized rapidly; œdema was no longer observed after the operation. Recovery has persisted in all the cases.

A. E. Maylard, of Glasgow, [213 Mar.] contributed an interesting article also strongly indorsing excision of varicose veins in the treatment of conditions resulting from them. Cases supporting this treatment are published by Howse [22 Aug.3]; Rogers [849 May]; Duchamp [228 May 15]; Wyman [339 Sept.]; A. F. Jonas [106 Apr.]; and Rémy, of Paris. [3 May 7] In a case presenting an arthritic diathesis, Petit [70 July 17] greatly benefited the extensive varicosity present by the use of tincture of hamamelis Virginica. Its method of employment is not mentioned. A case is also reported by Vergely and Ferron. [70 July 7] A case of arterial varix is described by W. T. Clegg, of Liverpool. [187 Jan.]

Amat, of Paris, [155 June 11] states that the varices sometimes found on the surface of internal organs, as the œsophagus, affect in the majority of cases the inferior members. Varicose dilatation is always produced in the extensor muscles of the thigh and the leg. Idiopathic varices are, properly speaking, only secondary symptoms, united to a special varicose diathesis. Physical causes also intervene to cause varices, as walking, prolonged standing, compression, as by garters, etc. Cerné [203 Mar.1] states that the best method of treating varicose ulcers of no considerable extent, and due to periphlebitis, is by resection of the bundle of diseased veins, although recovery does not always follow. Among the cases not benefited by this treatment are cases without superficial varices, eczematous ulcers, and large ulcers with deep lesions. Resection is most beneficial in ulcers of recent formation.

INSTRUMENTS.

An automatic forceps for rapid torsion was described by F. M. Briggs, of Boston. [99 Nov.19,'91] This instrument is calculated to check

the bleeding, not only from those vessels which have a distinct vessel-wall and can be easily isolated, but also from small bleeding points, provided they are seated in tissue which will allow them to be twisted. But in old cicatricial tissue, in the skin, etc., they are bound down, and tend to break off instead of twisting.

Improvements in artery-forceps were contributed by Leigh, of New York, $_{\text{Mar.26}}^{1}$ and Lewis, of Folkestone. $_{\text{Apr.30}}^{2}$ The former improved the catch and the latter the tip, both excellent modifications.

ORAL AND FACIAL SURGERY.

By RUDOLPH MATAS, M.D.,
NEW ORLEANS.

JAWS.

Dislocations.—In a paper entitled "Recurring Dislocation of the Lower Jaw: a Method of Treatment by Operation," F. Marsh, of Birmingham, England, $\frac{2}{\text{Apr.}30}$ says, "Hitherto the treatment of recurrent dislocation has been palliative only. An elastic bandage or some similar support for the chin is recommended, and the patient is cautioned against opening the mouth too widely. Even if this advice be followed,—which it seldom is for any length of time,—it is almost certain that in some moment of forgetfulness an incautious movement will reproduce the displacement and discourage the patient from wearing a restraining apparatus, which is always irksome, and certainly not becoming to either sex. In these cases, therefore, palliative treatment is inefficient and unsatisfactory."

The author proposes to permanently overcome the tendency to displacement by an operation which aims at checking "the forward movement of the interarticular cartilage, to prevent the condyle from reaching the summit of the convex root of the zygoma, and at the same time to interfere as little as possible with the normal range of movement of the jaw."

The following case, which is quoted in full, clearly explains the author's method of fixation of the interarticular fibro-cartilage:

On May 15th, under anæsthesia, the left temporo-maxillary articulation was exposed by an incision about an inch long, extending downward from the zygoma half an inch in front of the auricle. The capsule was opened and the interarticular fibro-cartilage was found to be exceedingly loosely attached. The external lateral ligament could be clearly defined. Following Annandale's method of fixing the cartilage in cases of subluxation, a catgut suture was passed through the periosteal attachment of the capsule to the

zygoma and through the margin of the cartilage; but in tying it in the deep and narrow wound it cut through the cartilage; fine silver wire was substituted, twisted, and cut off short. A second suture was now passed through the external lateral ligament and through the periosteal attachment of the capsule as far posteriorly as possible, so as to make a fold or tuck in the ligament and bind it down to the adjoining structures. The wound was then closed. It was anticipated that these sutures, assisted by the adhesions which would form during the healing process between the exposed part of the capsule and the surrounding tissues, would fulfill the first two aims of the method, and that careful asepsis would insure the third.

Primary union took place, and in twelve days the patient returned home, wearing an elastic bandage to restrain movement, and, for a time, limited to soft diet. She wore the bandage continuously for two months, and during this time there was no recurrence on either side. When she ceased to wear it, dislocation of the right condyle soon took place, and became of frequent occurrence; the left remained in place in spite of the extra strain thrown upon it during the manipulation for reducing the opposite side. The right articulation was, therefore, operated upon in a somewhat similar manner on September 25, 1890, but only one silk suture was used; this was passed through the external lateral ligament, the periosteal attachment of the capsule on the outer side of the glenoid margin, the interarticular fibro-cartilage, back through the external lateral ligament, and then tied. Primary union again took place, except along a small drainage-tube track, and the patient went home on October 8th, observing the same precautions as on the previous occasion.

Since the second operation there has been no recurrence of dislocation, and no trouble whatever has been experienced from the buried sutures. The cicatrices are hardly visible, even on close inspection; there is a distance of one and one-half inches between the front incisor teeth when the mouth is open, and when the jaws are closed the teeth meet accurately. She can open her mouth widely or gape without fear, and can eat anything; she is, in fact, so far as the dislocation is concerned, perfectly well.

The operation, though apparently simple, is not a very easy one to perform. The wound must be limited in length, because of

the anatomical surroundings; the tissues cut through are very vascular, and it is difficult both to pass the suture and to tie it sufficiently tight without cutting through the fibro-cartilage. On this latter account, aseptic silk or tendon will probably be found the most suitable material for the suture. In view of the possibility of suppurative arthritis and subsequent ankylosis, it is advisable to operate on one side at a time. The second operation should, preferably, take place soon after the healing of the first wound, and before the elastic bandage is discarded.

A sufficient length of time has now elapsed—over eighteen months since the second operation—to establish, beyond doubt, the permanent character of the result obtained by this method of treatment, the success of which has, in this instance, been so complete as to justify its employment in other similar cases.

At a meeting of the New York Academy of Medicine, $\frac{1}{\text{Mar.12}}$ R. H. M. Dawbarn presented a patient who had suffered a long time with dislocation of the inferior maxilla, the mouth being permanently open. The patient had had several attacks which suggested tetanus, and many attempts on the part of skillful surgeons to reduce the dislocation had failed. As a last resort, the speaker had made incisions almost dividing both masseter muscles, enabling him to reach the displaced bone and pry it back into place. The result had been permanent and satisfactory. In another case, Dawbarn had been able to effect reduction after nearly dividing only one of the masseter muscles.

The chairman (Joseph T. Bryant) thought that dislocations of the inferior maxilla must be preceded by relaxation of the muscular or ligamentous structures. In experiments upon animals it had been shown that dislocation could not be caused by spasmodic action of the muscles alone. The further discussion of the question elicited several cases of the same character, due to a variety of causes, such as vomiting, talking, laughing, gaping; also the direct application of severe force, as that of a blow from the clinched fist.

Luxation of the lower jaw backward (?) is discussed by E. Albert, of Vienna. $\frac{84}{\text{No.22}}; \frac{41}{\text{Aug.25}}$ It was formerly believed that this luxation could not take place unless the posterior wall of the maxillary joint was broken. Thieme, however, has collected a series of cases, from his own observation and from the literature, where a

luxation, without injury to the bone, was apparent. Albert had the opportunity to observe such a case in a very intelligent young lady, who declared that she awakened almost always with a trismic condition of the jaws (this condition is the chief symptom of the so-called backward luxation of the lower jaw). Three years before, she underwent a dental operation which required an unusually wide separation of the jaws. Next morning she awoke with locked jaws, and tried for more than an hour, in vain, to open her mouth. In despair she threw herself upon her bed, burying her head in the pillows; at this moment something gave way, and the lock-jaw was relieved.

This phenomenon was soon repeated, but without lasting so long, and she succeeded in opening her mouth by means of various external manipulations (pressure on the lower jaw at different places). She learned, in the course of time, to reduce the dislocation readily by certain indescribable contractions of the masticatory muscle. Neither swelling nor pains ever appeared,—only a disagreeable feeling in the region of the maxillary joints being noticeable. The lower jaw seemed, upon examination, to be somewhat displaced to the right. In opening as well as in closing the mouth, and also on local displacements, a distinct grating in both maxillary joints was heard. The lateral deflection disappeared completely upon opening of the mouth, when the teeth of the upper jaw stood symmetrically opposite those of the lower jaw on both sides. The author recommended massage of the maxillary joints, to avoid, if possible, further deformation of the joint.

The question, "Is there a laceration of the capsular ligament in cases of dislocation of the lower jaw?" is exhaustively considered, and answered in the negative, by Schnitzler, of Vienna. $\frac{336}{\text{Nov.14,'91}}$ This is contrary to Nélaton's opinion, that laceration of the capsule always took place.

Fracture.—Fracture of the upper jaw, with malar depression, occurs so frequently at foot-ball, and is so easily overlooked, that the paper by Wherry, of Cambridge, England, $\frac{6}{\text{July 9}}$ calling attention to the subject, is timely and instructive. A more serious case of fracture of the superior maxilla, in which the malar was replaced from within, and which was caused by a base-ball striking the malar bone, is reported by Crowley. $\frac{147}{\text{Sept.9}}$

A rare case of double fracture of the upper jaws in four frag-

ments is the subject of an admirable report by Walther, of Paris.[7 Nov.6,'91] The patient, a youth of 18 years, was struck on the root of the nose by the sharp edge of a barrel filled with petroleum, while he was loading a wagon. A gaping wound, shaped like an inverted V, separated the cut through the root of the nose, and extended obliquely on each side to the cheeks. The wound led directly to the nasal fossæ, and disclosed the complete separation and downward displacement of the bodies of the upper jaws. It was likewise discovered that the two maxillæ were separated by an antero-posterior median fissure, into which a finger could be readily introduced. The vault of the palate was cut into two parts throughout the extent of the hard palate. The lateral portions of the maxillæ were also vertically split into two parts, as shown in drawings. The patient recovered, with some deformity. The author has been able to reproduce the picture on the cadaver by striking a heavy blow, or succession of blows, on the root of the nose while the head was in flexion and the chin resting on a block of wood. The lower jaw here acts as a wedge, which splits the intermaxillary suture first. In clinical experience the sternum serves as a point of resistance to the flexed chin.

Ankylosis.—Greig, of Dundee,[6 Dec.19,'91] reports a case in which he practiced excision of the condyle and neck of the inferior maxilla for osseous ankylosis of the right temporo-maxillary articulation. The patient, a boy of 12 years, could trace his condition to a suppurating parotitis consequent upon scarlet fever. Rovsing, of Copenhagen,[373 No.12; 673 Aug.] exhibited before the Medical Society of Copenhagen two patients on whom the Bottini-König operation had been performed with excellent functional results. The one patient was a woman, aged 33 years, in whom both joints were ankylosed from pyæmic pyarthrosis; the other a girl, aged 11 years, with osseous ankylosis of the left jaw-joint. Rovsing laid stress upon two dangers connected with the operation, arising from the tongue slipping backward during the operation, and also, later, on account of the loosening of the jaw.

Redier, of Lille,[220 Dec.18,'91] reports a case of permanent occlusion (trismus) of the jaws occurring in a child aged 9 years. The teeth could not be separated five millimetres. The condition was caused by an enormous phlegmon of the cheek, due to a fall. The peculiarity of the case is the notable atrophy of the

lower jaw, from arrested development. The whole jaw, with the exception of the alveolar process and teeth, was in an infantile condition and gave the face a remarkable expression, *tête de mouton*, from absence of the chin. The muscles of mastication, including the masseter, buccinator, and pterygoid, were entirely atrophied and reduced to a fibrous condition. The condition was apparently hopeless from a therapeutic stand-point. Vallas, of Lyons, $^{211}_{\text{Apr.10}}$ reports a case of ankylosis of the jaws, due to arthritis, in which great improvement was obtained by the resection of both condyles and part of the descending rami of the jaws. Care was taken to avoid injury to the facial nerve. Rose, of London, $^{22}_{\text{Apr.13}}$ took away the articular process and what remained of the coronoid process after a former operation,—in fact, all the right side of the lower jaw down to the ramus,—from a man, aged 37 years, who was suffering from ankylosis. The patient, when a boy, had been struck by a schoolmaster on the jaw with a ruler, and, as Rose remarked, the bone must then have been fractured. Some weeks ago the same surgeon removed the coronoid process and remedied the ankylosis to a certain extent, but the mouth had closed again. He observed that it was strange in this case that the articulation on the other side was perfectly free, as, after operating on the present occasion, he easily got the mouth open.

Tumors.—A case of "Multiple Osteomata of the Lower Jaw" is reported by Lezius from the clinic of Skliffosowski. $^{21}_{\text{May 23}}$ The osteomata (eburnated) were found on the outer surface of the lower jaw, both angles, and ascending rami, and were as large as small walnuts. Other similar tumors were formed on the squamæ of the right and left occipital surface. The ulnæ presented the same growths. The patient, a girl aged 12 years, was relieved of the tumors by operative treatment.

A case of myeloid sarcomata of upper and lower jaws, in a child of $3\frac{1}{2}$ years, treated by partial excision of the lower and complete excision of the right upper jaw, is reported by A. Parkin, of Hull. $^{2}_{\text{May 21}}$ The points which appear to be of special importance are: "1. The existence of a double swelling, of very rapid growth, with threatened asphyxia from pushing back of the tongue. 2. The rapid recovery in each instance from so serious an operation performed on so young a child. 3. Absence of any complication; this I attribute to the careful application of the ethereal solution

of iodoform. 4. The rarity of the case; C. Heath, in his essay on the jaws, stating that myeloid sarcomata of the jaws occur after twenty-five years of age. The amount of repair which has taken place in so short a time (three months) seems to me surprising. There is scarcely a trace of a scar visible on the lower lip. The two portions of the lower jaw are united by dense fibrous tissue, with what feels like some new bone on the left side, and in the centre the new tissue causes the chin to retain its prominent shape. The repair is greatest in the situation of the right upper jaw, where a firm mass of tissue has developed in the situation of the gums, and resembling very much the alveolus on the opposite side. Behind this is a small gap, scarcely more than three-fourths of an inch from before backward and one-fourth inch from side to side. There is no trace whatever of any recurrence, and the child, though pale and still weak, can talk quite well, and takes her food without the slightest difficulty. The amount of disfigurement is extremely slight; the only thing visible is a slight sinking in of the lower lip and a little prominence of the left upper central incisor. There is no displacement of the right eye."

A sarcoma of the upper jaw treated by excision—no recurrence after four years—is reported from Mordant Baker's clinic, at St. Bartholomew's Hospital, London. $^{6}_{\text{Nov.14,'91}}$ The great interest in this case lies in the fact that, although the patient has passed the three years' limit, before which no case can be regarded as even comparatively safe from recurrence of malignant disease, no matter how carefully it has been removed, there is no evidence of return of the growth. It is the more important to place such on record, although we are without any definite idea as to the minute structure of the tumor, because the result of operations for carcinoma or sarcoma of the superior maxilla is so unsatisfactory. Butlin $^{2166}_{\text{'87}}$ says: "Out of sixty-four cases of which the result is recorded, only four can be regarded (from the three-year limit) as successful, and in one of them the disease re-appeared at the end of nine years. The prospect of surgical treatment is very gloomy." The history of this case resembles somewhat that of one successfully treated by Ohlemann,—a slowly-growing tumor of the alveolar border of the lower jaw.

Charles McBurney $^{1}_{\text{May 21}}$ showed a man, 62 years of age, who had come to him two weeks and a half before with an osteosarcoma

of the left upper jaw. He had felt some hesitation in operating because of the extensive encroachments of the tumor. The operation was, however, done in the usual way. The growth, being too soft to remove *en masse*, was taken away piecemeal with scissors and curette. The speaker wished to urge the advantage of preliminary tracheotomy when operating upon such very vascular tumors, as this proceeding allowed one to pack the lower pharynx with sponge, and so entirely avoid the entrance of blood into the trachea. Etherization, also, went on uninterruptedly through the tracheal tube. It seemed to him that the plan he had followed was simpler and better than that dependent upon the use of the tampon of Trendelenburg. The preliminary tracheotomy was rapidly done, and there was no irritating cough, such as usually occurred when one made use of the tampon of Trendelenburg. As to the method of nutrition for these patients, McBurney again urged rectal alimentation exclusively for a period of some days after such operations about the air-passages. In this old man it had been carried on for three days without any evidence of weakness from lack of food. He had been thus fed every four hours, and had been given an ounce (30 grammes) of whisky, an egg, half a drachm (2 grammes) of salt, and 4 ounces (120 grammes) of water each time.

Prothetic Operations.—The very remarkable results obtained by Claude Martin, of Lyons, [2167/89] by the application of his ingenious and varied prothetic devices for the correction of maxillary and facial deformities are being constantly confirmed. The great merit of Martin's work, as already noticed in previous issues of the Annual, lies in his demonstration of the tolerance by the tissues of even large prothetic substitutes for excised parts, which can be applied immediately after operation. The profession has always looked with well-founded skepticism upon all prothetic apparatus intended to remain permanently in the tissues, but the ingenuity of Martin has succeeded in practically overcoming most of the difficulties in the way of a permanent implantation of these correcting devices, and has obtained clinical results which deserve the greatest attention, especially since they have been confirmed by the most trustworthy and eminent representatives of the School of Lyons. The emphatic confirmation of these results by such cautious and competent witnesses as Ollier, Poncet, Tripier, Mol-

lière, and Gangolphe, in whose clinics the original experiments were conducted, gives a character and stability to Martin's results which is wanting in similar ventures in this interesting field in the hands of other investigators. Among the many cases reported during the year, in which immediate prothesis has been applied, we will briefly mention the following:—

A case in which almost the entire inferior maxilla was resected for malignant disease by Shandelux. $^{211}_{\text{May 22}}$ A prothetic apparatus, representing the excised portion, was immediately substituted by Martin himself. The apparatus corrected the deformity entirely and was well borne by the tissues. The patient was presented to the National Medical Society of Lyons, and Ollier, who was present at the meeting, considered the result "excellent, even magnificent."

Gangolphe, of Lyons, $^{3}_{\text{Apr. 27}}$ thus expressed himself at the Sixth Congress of French Surgeons: "I believe in the advantages of immediate prothesis in resections of the inferior maxilla. On January 2, 1891, I resected over one-half of the left half of the lower jaw for sarcoma, occurring in a young subject. A prothetic apparatus (Martin's) was immediately substituted for the resected portion. The artificial jaw was attached to the bony half by a platinum screw, which allowed the artificial and natural halves to move as a whole. The operative results were very simple. On the tenth day the patient commenced to eat bread. When seen, fifteen months afterward, there had been no recurrence, and, from the functional stand-point, the result was excellent." Gangolphe insists upon the most careful cleanliness (antisepsis) of the mouth.

Meunier, of Paris, $^{7}_{\text{June 10}}$ reports a case of epithelioma of the lower jaw, treated by resection, associated with immediate prothesis. The operation was performed by Ricard, June 3, 1892. The tumor occupied the median portion of the alveolar border, and had caused the detachment of two incisors; it was continuous posteriorly, with an irregularly infiltrated mass, which caused a bulging of the buccal floor.

The operation consisted of:—

1. A resection of the body of the maxilla (and symphysis) beyond the diseased area. 2. Excision of a corresponding portion of the floor of the mouth and involved lymphatics. 3. The immediate interposition of a piece of gutta-percha, prepared *in*

loco, which was sutured to the two rami, and which was utilized as an insertion for the detached muscles of the tongue.

McBurney, of New York, $\frac{1}{Jan.30}$ after calling attention to the great discomfort which resulted to patients subsequent to the removal of part of the lower jaw from imperfect articulation of the teeth, cited a case in which he had done this operation for sarcoma, and had called in other aid with a view to mechanically overcoming the subsequent difficulties. At the time of the operation he had had an interdental splint made, which was worn during the healing process. Afterward, Albert Westlake had devised the apparatus, a model of which he exhibited. This device was still worn to-day by the patient with absolute comfort, keeping the teeth of the half jaw remaining in perfect articulation with those of the upper jaw, and enabling the patient to masticate easily and perfectly. Absolutely no lateral displacement of the jaw existed to-day.

These cases and others that have been reported during the year illustrate Martin's method of immediate prothesis, *i.e.*, the application of artificial substitutes for resected parts at the time of operation. Other interesting reports have appeared which demonstrate the value of prothesis with Martin's appliances long after operation, *i.e.*, after the healing of the wound, and after cicatricial contractions have taken place. Among these we would mention a careful report by Beltramé, of Marseilles, in which the deformity consequent upon a total resection of the right upper jaw for malignant disease was very satisfactorily met by a permanent prothetic apparatus. $\frac{46}{July\,1}$ The object of the apparatus was to correct the disturbance in phonation, deglutition, and mastication, which were marked in this case. The apparatus was made of mixed soft rubber, hard vulcanite, and immediately overcame all the disturbances referred to.

A more difficult and complicated deformity of the lower maxilla, resulting from long-standing necrosis and caries, of doubtful origin, was successfully treated by Martin himself. $\frac{211}{Mar.27}$ The patient, a male aged 40 or 45 years, lost the two lateral halves of the lower jaw. In consequence of this the anterior portion of the horseshoe, formed by the jaw, which had yet attached to it the incisors, the canines, and the molars of each side, was thrown backward in an inclined position downward, which made it im-

possible for the teeth to meet, and also caused a very ugly retraction of the chin. By means of splints and plate, and subsequent modifications, excellent results were obtained, in spite of the carelessness of the patient and many obstacles which seriously interfered with the prothetic treatment.

Other Operations.—Hartley $\frac{1}{\text{Sept.10}}$ presented before the New York Surgical Society a man, 66 years old, from whom, fifteen months before, he had removed the superior maxilla and the greater portion of the cheek on the left side. He had done skin-grafting as far as possible, but there still remained a large open surface. A month before the patient had returned for the purpose of having the wound closed, if possible. The wound was freshened and a large flap taken from the neck to close it, measuring from four to six inches. It was sutured in position and dressed in a salt solution. The wound of the neck was covered with skin-grafts, and also dressed with the salt solution. In two weeks the pedicle was cut. The flap and grafts had all grown satisfactorily. These large non-vascular flaps from the neck usually slough.

B. F. Curtis mentioned two cases in which he had taken flaps from the neck after an operation for carcinoma. In his first case, where an epithelioma had been removed from the cheek by excision and caustics, a deep, unsightly cicatrix had been left. In order to fill this a large flap was taken from the right side of the neck, extending well up to the angle of the lower jaw. This flap sloughed completely off to within half an inch of its base. He then performed Bardenheuer's operation, including the angular artery in the base of the flap, thus making it very vascular. The flap grew in its new place, and the result was very satisfactory.

In the second case, at the Cancer Hospital, in February, the greater part of the superior maxilla, with the cheek, was removed for carcinoma. In this case, as in the one first mentioned, the flap was taken from the forehead. The result had been very good. Curtis had hoped there would be no contraction of the cicatrix, but had been disappointed. The patient used a cork wedge several hours daily, to overcome this contraction.

Bardenheuer, of Cologne, $\frac{41}{\text{Aug.1}}$ continues to report progress in his plastic operations for the immediate correction of deformities resulting from extensive operations for the removal of cancer

of the jaw and oral cavity. Since his last publication (*vide* ANNUAL, 1892, vol. iii, K–29) he has operated seven times and filled the gaps left in the oral cavity, in some cases, with osteoplastic flaps borrowed from the forehead. In malignant growths, limited to the alveolar process, a partial resection is performed and the defect in the soft parts corrected by borrowing a pediculated flap. The epidermal surface is turned into the mouth and sutured. This procedure corrects the deformity and prevents cicatricial ankylosis of the jaws. The gap in the forehead is covered with Thiersch grafts. If the inner bony surface of the lower jaw be involved, Bardenheuer proposes to chisel off the growth with its periosteal attachments, and to cover the defect with an osteoplastic (König) flap. When conservatism is impossible, and resection through the continuity of the maxilla is required, a similar osteoplastic forehead flap is used to fill up the defect. In cases in which the palate is involved, as in a case mentioned by the author, flaps may be borrowed from the posterior wall of the pharynx and utilized in conjunction with cutaneous flaps.

Wölfler, of Graz, who discussed Bardenheuer's paper before the German Surgical Congress, stated that he utilized osteoplastic flaps, borrowed from the neck and clavicle to correct the deformity after resection. He has substituted a fragment of clavicle attached to a cutaneous pedicle for a resected portion of the lower jaw.

At a meeting of the Aerztlicher Verein, Hamburg, Lauenstein $\frac{34}{\text{Mar.1}}$ presented (*a*) a woman, 33 years of age, the left half of whose lower jaw had been resected for sarcoma two years before. Resection of the lower jaw is condemned by many authors on account of its bad functional results. The case presented shows how unfounded this view is. The whole left branch of the lower jaw was resected with saving of the N. facialis. The result now, after two years, is cosmetically as good as it is functionally excellent. Patient has no prothetic appliance; when the mouth is closed, the remaining teeth fit exactly together. When the mouth is opened, the region of the left lower jaw recedes a little to the left and backward. A relapse has, so far, not occurred. (*b*) A woman, 60 years of age, from whom a tonsillar carcinoma of the left side was removed on July 4, 1891. Lauenstein gained entrance to the tonsil by following Mikulicz's method, viz., by sawing through the ascending branch of the lower jaw. The tumor was of

the size of a pigeon's egg. The operation was performed with the head hanging dawn. In this, as in the foregoing case, he operated without preliminary tracheotomy, which he has avoided as much as possible in later years. (*c*) A woman, 46 years of age, who, two years ago, had passed through typhus fever. In connection with this a peculiar, one-sided, inflammatory ankylosis of the jaws was developed, the consequence of an osteomyelitis in the maxillary joint, with consequent necrosis and fistula formation. Lauenstein resected a piece of the ascending branch of the jaw with the proc. coronoides. The patient could, four weeks later, open her mouth quite well.

MISCELLANEOUS.

Schoell, of Gand, $\frac{454}{\text{Dec.,'91}}$ reports a case of wound of the cheek and upper jaw in a soldier, the blade of a knife becoming lodged in the body and antrum of the upper jaw, and remaining there without any serious consequences. The blade was broken from the handle of a dirk or dagger, and was over three inches long (?). Several attempts were made to extract it; but, failing in this, the wound was allowed to heal over the foreign body.

Gerster, of New York, $\frac{101}{\text{Nov.,'91}}$ emphasizes the necessity of removing the layer of eburnated compact bone that is found lining the cavities left by the discharge of osteomyelitic sequestra in the lower jaw. The maxillary fistulæ, which are connected with these cavities, discharge little and do not granulate or fill up, because the ivory-like tissue, which lines the cavities, is poorly organized and few vessels can penetrate the compact tissue. The only relief for this condition lies in the excision of the eburnated tissue until sound vascular bone is reached.

At the Société de Chirurgie, of Paris, Gérard $\frac{22}{\text{Apr.13}}$ related the case of a little girl who was brought to him for a small purulent fistula of the chin. He attributed the condition to a strumous disposition, and recommended incision and scraping away of the diseased bone. The teeth were healthy. The operation was not consented to, and for some time he heard no more of the case. However, he subsequently learned that the child was cured by a dentist, who had drawn one of the incisors and replaced it, after having cut away the end of the root, which was diseased. The case interested him greatly, and he spoke of it to Le Fort, who told him that he had met with two similar cases, and that he thought it

worthy of bringing to the notice of his colleagues. Monod, Quénu, and Auger said that they had also observed several of these fistulæ, which were cured by the treatment described.

SALIVARY GLANDS.

Nothing very remarkable has been added to the literature of salivary disease during the year. The usual contingent of clinical reports of cases of salivary calculi has been received, and those who are interested in the multiple phases of this condition will find the details in the following papers: "A Case of Salivary Calculus in Wharton's Duct," by Chatellier, Paris $^{37}_{\text{May}}$; "Removal of a Submaxillary Calculus Weighing Eighteen Drachms (Seventy-two Grammes) Avoirdupois," by Eagle, Folsom, Cal. $^{147}_{\text{Feb.}}$; "Multiple Calculi in Wharton's Duct," by Wagner, St. Louis $^{786}_{\text{June}}$; "A Case of Salivary Calculus," by Dorschug, Cincinnati $^{53}_{\text{Mar.12}}$; "A Case of Salivary Calculi," by Le Dentu, Paris $^{100}_{\text{Aug.9}}$; "A Calculus in Wharton's Duct," by Thorington, Philadelphia $^{9}_{\text{Aug.13}}$; "A Salivary Calculus," by Weinlechner. $^{57}_{\text{June 12}}$

Radical Cure of Ranula.—Félizet $^{336}_{\text{No.10}}$; $^{101}_{\text{Aug.}}$ recommends that the ranula be laid open by an incision through the mucous membrane. After the fluid has been evacuated, the cavity is packed with pieces of sponge, and then the entire cyst can be enucleated without difficulty.

Tubercular Inflammation of the Salivary Submaxillary Gland.—A specimen of this condition was presented by Frederick Kammerer, at the New York Surgical Society, May 25, 1892, $^{1}_{\text{Sept.10}}$ who said he had never seen nor heard of a similar case. The tumor had been removed from a woman who had tuberculosis of both elbows, one knee, and the spine. No microscopical examination had been made, as the miliary tubercles had been convincing.

Dermoid Cyst of the Floor of the Mouth.—In presenting a cyst of this class removed from a patient, Guérin, of Paris, $^{3}_{\text{June 1}}$ referred to a recent thesis by Cail, in which forty-six observations were collected from all sources. Out of this number, twenty-four were treated by intra-buccal extirpation, which proves that this method is far less objectionable than it is generally believed to be. Union by first intention may be obtained in the mouth as elsewhere, though this is not usually attempted by operators.

LIPS.

In a paper on "Malformations of the Lower Lip," Stephen Paget, of London, $^{6}_{\text{Aug.27}}$ briefly but instructively reviews the more notable congenital malformations peculiar to the lower lip. Median cleft of the lower lip, hypertrophy of the mucous membrane, hypertrophy of the whole lip, and congenital sinuses of the lower lip are the special subjects considered. *A complete fissure of the upper lip*, with total absence of the median tubercle, is carefully studied by A. Broca, of Paris, $^{7}_{\text{Oct.,'91}}$ in its embryological relations, and especially with reference to Albrecht's theory of harelip.

Mandibular Tubercles and Receptacles.—At the London Pathological Society, $^{2}_{\text{Nov.21,'91}}$ Bland Sutton read a paper on the mandibular tubercle, which is occasionally found in one or both cheeks of children, at a point from two to four centimetres behind the angle of the mouth. He described four cases. In three there was a distinct cicatrix in the buccal mucous membrane opposite to the tubercle, while in the fourth this was absent. One of the tubercles, examined microscopically, presented the structure of a small dermoid. It was pointed out that, in many dogs, the presence of such nodules on the cheek was the rule, and that they were due to imperfect closure of the posterior portion of the mandibular cleft. Stephen Paget showed some drawings, which he had had copied from original publications, of saccules of the lower lip, of which several had been reported. In most of the cases there were other deformities also, the most common being harelip. Bland Sutton explained the recesses on developmental grounds. At first the lower lip was widely cleft. If perfect union did not take place, a recess, or two recesses, or a median harelip condition persisted. This, though rarely seen in human beings, persisted for a long time in kangaroos. Three forms of abnormality could occur,—dermoids, recesses or saccules, and tubercles. In the lower lip the first two had already been found, and he was convinced that tubercles would be found some times if looked for. Stephen Paget did not entirely agree with Sutton's explanation that there should be only one,—a median saccule,—and not two, as were shown on the drawings. Sutton pointed out that he had shown that two tubercles did exist, side by side, beneath the lower jaw of some dogs. These, he considered, were comparable to Paget's recesses.

Median Facial Cleft.—A very rare case of median facial cleft is reported by A. Wölfler, $\frac{336}{\text{May 28}}$ in an infant 23 days old. The lower lip was split in the median line into two halves, which were again connected by cicatricial bridge in the lip proper. The latter, more strongly developed in its upper part and drawn toward the oral cavity, extended into the median line of the chin and into the neck down to the supra-sternal fossa (jugulum), becoming narrow and flatter as it descended. The cicatricial fissure in the lip corresponded to a defect in the lower jaw itself. This consisted of two halves, which were united by loose connective tissue and ran downward toward the median line. The movable median ends of the two halves of the lower jaw were decidedly thinned, narrowed, and terminated in a rounded and flat extremity. More interesting yet was the condition of the tongue; the anterior portion was divided longitudinally in two halves, like the leaves of an open book. The mobility of these two halves was much interfered with by the adhesion of a median cicatrix, at the bottom of the fissure, to the floor of the mouth. The base of the tongue was not split. It was, therefore, a median cleft of the lower lip, involving the lower jaw and tongue, the lateral halves being held together at a distance by a cicatricial formation.

After a period of six months, operative treatment was determined upon. After splitting the cicatricial bridge, connecting the two halves of the lower lip and lower jaw, the cicatrix of the tongue, running into the median line, was first dissected from the floor of the mouth. The tongue was thus divided into two longitudinal halves, which, after removal of the cicatricial edges, were sutured, whereby the normal form of the tongue was restored. Then two pieces, each one centimetre wide, were removed from the ends of the jaw in order to obtain fresh bone surfaces, and united by means of silver wire. Finally, the edges of the soft parts of the lower lip were freshened and sutured *à la* Mirault-Langenbeck. The healing of the wound progressed uninterruptedly. A small and final operation was required and performed for the correction of the cicatrix of the chin drawn into the groove at the lower end of the united lower maxillary.

Some months later a white spot on the point of the nose of the child, which had been quite insignificant at first, had strikingly increased in extent, and presented a soft and greatly-raised

prominence. After cutting into it, a dermoid was found, to the surprise of the operator, growing firmly to the skin and nasal bone and reaching up to the point of union of the nasal bones with the frontal. This deformity was completely removed by extirpation. The chief interest in the malformation here described lies in the question of its embryonal development.

Harelip.—The literature of harelip is not so heavily burdened this year as in the past; yet several good reports have been presented, among which the following are worthy of notice:—

"The Surgical Treatment of Harelip," by James R. Wallace, of Calcutta (eleven cases detailed). 239 Dec.1,'91

"On Some Peculiarities in the Operative Technique of Harelip," by G. Phocas, of Lille. 100 Aug.16,18 In this paper, and in a subsequent communication to the Société de Chirurgie of Paris, the author especially insists upon the value of Rose's position (with the head thrown backward) in all cases of complicated harelip; he believes (1) that it facilitates hæmostasis by compression; (2) it favors the ready outward flow of blood through the nostrils, and thereby aids the anæsthesia; and (3) it greatly expedites the local operative procedures.

Hagedorn 336 No.14; 112 June describes a further modification of his operation for harelip. Too much tension on the united wound is to be relieved by lateral incision into the cheeks beneath the alæ of the nose, but these are not often necessary.

Tumors.—In view of the interest aroused by various communications to the *British Medical Journal* on "Epithelioma of the Upper Lip," W. Roger Williams 2 Apr.11 contributes the following statistical information on the subject:—

"Of 13,824 primary neoplasms of all kinds consecutively under treatment at St. Bartholomew's, University College, Middlesex, and St. Thomas's Hospitals, during the last sixteen to twenty-one years, 352, or 2.5 per cent., originated in the lips. These include 7297 cancers, of which 332 grew from the lips, or 4.5 per cent. Of the 352 lip-neoplasms, 340 sprang from the lower lip. Thus: epithelioma, 329 (M. 326, F. 3); papilloma, 7 (M. 4, F. 3); angioma, 3 (M. 1, F. 2); cystoma, 1 (M.). Only 12 originated in the upper lip. Thus: epithelioma, 3 (M. 1, F. 2); sarcoma, 4 (M. 2, F. 2); angioma, 3 (M. 1, F. 2); papilloma, 1 (F.); fibroma, 1 (M.). Curiously enough, these three cases of epithelioma of the

upper lip all came under my observation at the Middlesex Hospital when I was surgical registrar there."

PALATE.

Urano-Staphylorrhaphy.—A writer states [80 July 15] that it is probable that Trélat is responsible for the disfavor with which operations on young children for cleft palate are now regarded by most surgeons, since this distinguished operator stated that in infants the mortality is exceedingly high. This opinion is apparently confirmed by Ehrmann, who states that, of ten cases operated on before their second year, nine died before the fourth year. Debove [211 V.70] reports two successful operations on young children, both patients having lived for many years after the operation, and both having functional and mechanical restoration. The articulation was perfect, there being but the slightest trace of the nasal tone characteristic of unrepaired palatine defects. Probably basing his opinion upon these successes, the author states that, when the child is strong and well nourished, an effort should be made at closing the palate long before the time laid down as proper by the majority of surgeons. At an early age the resistance on the part of the child is slight or wanting altogether. A few drops of chloroform, given from time to time, entirely overcome the feeble struggles. Although the operative field is small, the palatine arch is not so high, and is much more accessible than at a later age. Hæmorrhage in these young children is always slight, and is easily arrested; the stripping of the mucous membrane, with its underlying periosteum, is easy; the vitality of the flaps is distinctly greater than at a more advanced age, and adhesion between the sutured surfaces is much more likely to take place.

Liknaitzky [2007 June] carefully considers the advantages of palatoplasty in two sittings, as advocated by J. Wolff and Polaillon (*vide* ANNUAL, 1891, vol. iii, K–66, 67). The method of operation advocated is that of the muco-periosteal flaps, or the Baigeau-Langenbeck operation, and the operative manual, as practiced by Trélat and modified by Polaillon, is especially described.

At a meeting of the New York Surgical Society Wyeth [1 Feb 6] presented photographs of a case of cleft palate affecting the anterior half, and not the soft parts, in which there was complete lateral harelip. He mentioned the case to call attention to a little point

in correcting the deformity of the nose. When the bone was deficient on one side, the ala nasi resting upon the short side was always flattened out and receding. In order to correct this, it was necessary to divide the upper maxilla on the short side, bring the anterior fragment forward to the level of the normal bone of the opposite side, and wire or pin it in this position until it united with the opposing maxilla. The alæ nasi of both sides rested on the same plane and the deformity disappeared. When there was a projecting process of bone on one side, his practice was to crush this piece back and suture it in line with the short maxilla. In the case reported this operation had met with success.

Stimson stated, in the discussion, that he had obtained good results, in cases of double cleft palate, by dividing the premaxillary bone a little posteriorly and dropping it back to the line of the other two and fixing them in place. He thus saved all of the lip, and often some of the incisor teeth.

The salient features of the operation for cleft palate are presented by W. E. Casselberry, of Chicago. [61 Apr. 2] This operator prefers chloroform as an initial anæsthetic, administered in Rose's position, and Massey's modification of Whitehead's gag with tongue-depressor attached. For the sutures, a long-handled curved needle, to be used after complete relaxation of the velum palati has been obtained by division of the palatine muscles and pillar of the fauces; only one posterior pillar of the fauces is divided, in addition to the anterior pillars. Davies-Colley's method (*vide* ANNUAL, 1891, vol. iii, K–67) is recommended by the author in wide clefts. Silk sutures are used for the whole line of sutures. A method of passing the sutures with the help of the curved needle is described, which is simple, but not more advantageous than suturing with the aid of a Reverdin or Trélat needle.

HYOID BONE.

Tumors.—A very complete and valuable contribution on the tumors of the hyoid bone is made by J. Spisharng, from the clinic of Skliffosowski, Moscow. [69 Sept. 22]

TONGUE.

Congenital Macroglossia.—A case of this deformity is reported by A. Fahmy. [235 June] The patient, a girl, was 5 years of age. Fahmy removed four inches by the écraseur, first dividing the organ

mesially by repeated snips of the scissors (to avoid hæmorrhage), and then applying the wire of the écraseur to each half separately. The écraseur was screwed up slowly and steadily, and so the tissues were cut through with but little hæmorrhage. Fahmy preferred removing each half separately, in order to have better control over the bleeding, and also on account of the large size of the organ. Result, perfect recovery, with, of course, marked improvement in the appearance of the patient.

Lymphangioma Linguæ Congenitum.—A case is reported by Fürst, of Leipzig.[158] B.14,H.6 While diffuse or one-sided hyperplasia of the adenoid tissue of the tongue, which is the basis of macroglossia, is not altogether rare, a cavernous, varicose dilatation limited to a particular region is a decided curiosity. The author operated upon a child, aged 5 years, who had been born with the growth, first the size of a pin-head and then growing to that of a pea. No recurrence followed the extirpation, and the microscopic examination confirmed the diagnosis.

Congenital Cysts.—Stephen Paget[2] May 21 showed a large congenital cyst removed from beneath the tongue of a little girl, a patient of Mitchell, of Brockley. The growth, protruding far out of the mouth, almost suffocated her at birth. It was at once tapped, and nearly a tumblerful of clear, serous fluid was drawn off. It was tapped again and again during the first year of the child's life. It now hung down to the sternum as a heavy, pear-shaped mass, covered with a thick, harsh cuticle. The tongue was spread out over its upper aspect; the mucous membrane of the floor of the mouth was lifted up level with the teeth; the lower jaw was twisted, flattened, and rotated outward and downward. The cyst was separated from the tongue above it and the floor of the mouth beneath it, and was easily removed. The child could, at the time of report, nearly close her mouth, and the lower jaw was recovering its proper shape. There was no solid growth, either inside the cyst or around it; the cyst-wall was plain fibrous tissue, not lined with epithelium. It was neither a dermoid cyst nor a "cystic hygroma"; probably it was of the same nature as the "hydrocele of the neck" described by Hutchinson.

Cancer.—The operative treatment of malignant disease of the tongue continues to be the subject of discussion. Jonathan Hutchinson, of London,[187] Jan. spoke on the subject in his usual inter-

esting and conservative manner before the Liverpool Medical Institution. He[806 Jan.] thus summarizes his own paper and the more salient features of the discussion that followed its reading: "The chief points which my paper had endeavored to prove were (1) that return of cancer in the tongue itself is rare, whilst return in the glands is very common; (2) that partial operations—*i.e.*, not involving removal of the whole tongue—are well justified by results; (3) that gland-infection often occurs very early in the case, in some instances almost preceding the recognition of the ulcer itself as being malignant; (4) that the results of operations are very encouraging when done early, and that it is desirable in all practicable cases to perseveringly follow up the disease if it return in the lymphatic glands. Lastly, I put in a plea for the use of the écraseur in preference to cutting-instruments, as involving less loss of blood and obviating all risk of blood finding its way into the trachea."

Hutchinson is probably the most authoritative living advocate of the écraseur in the extirpation of the tongue, and his views on the subject are, therefore, most pertinent: "In comparing the écraseur with other methods of operating for cancer of the tongue, I have not the slightest hesitation in giving it preference as being the one the most adapted for general use. For experienced anatomists, fresh from the dissecting-room, ligature of the linguals in the neck has its obvious attractions. Even in their hands, however, it has been occasionally found that, contrary to expectation, the arteries would pour forth blood when divided in the mouth; nor clearly can this operation be commended as one adapted for surgeons generally; it needs great and constant practice for its skillful performance. Operations by means of the scissors, Whitehead's operation, etc., are, again, chiefly suited for those who have a good staff of trained assistants, and they are, even in such hands, by no means always exempt from very serious losses of blood. To many of those who are the subjects of cancer of the tongue any material loss of blood is a matter of grave moment. These patients are often old and debilitated, to begin with; and I cannot but think that it is the hæmorrhage at the time of the operation, and not anything in the condition of the wound subsequently, which is the great source of danger; hence the strength of my plea for the bloodless method by the écraseur. Not only is

the loss of blood in itself important to the patient, but bleeding into the mouth in one who is under an anæsthetic is always, as is well known, attended by risk that blood may find its way into the air-passages. Secondary pneumonia, which has so often proved the cause of death, is, it may be suspected, quite as often due to this accident as to the secretions from the wound. At any rate, the fact remains that the écraseur wounds heal well, and do not poison the lungs. I have come to regard excision of the tongue as a procedure which does not really involve any risk of life."

The discussion which followed the paper was of great interest and value. Among those who took part in it were Rushton Parker, Crawford, W. Alexander, Paul, Harrisson, and Taylor.

"Those who spoke in the discussion related some very triumphant results from bold surgery in dealing with the lymphatic glands and adjacent soft tissues. Almost all speakers had cases to relate in which, after such operations, immunity had followed, which justified the belief that the disease was eradicated. I was particularly gratified to observe that, without, I think, a single dissentient voice, the hypothesis of the local origin of these forms of cancer, and of the 'pre-cancerous' stage, were fully admitted. Upon the full acceptance of these hypotheses, as it appears to me, far more than upon the surgeon's selection of any one particular method of operating, rests the safety of our patients. If we believe in the pre-cancerous stage, we shall be eager to remove freely all ulcers which are suspicious, and if we have firm faith in the local character of the malady, even after the glands have become implicated, we shall be zealous to follow up the removal of the initial ulcer by the extirpation, when practicable, of all secondarily infected structures."

In connection with Hutchinson's paper, the following letter from W. Roger Williams is also very pertinent and interesting $\frac{2}{\text{Jan.}}$:

"I have read Mr. Hutchinson's impressions of the results of his operation for excision of the tongue by the wire écraseur with considerable surprise. He says, '1. I have lost only a single patient, so far as my memory serves me, in twenty years' practice. 2. I have come to regard excision of the tongue as a procedure that does not really involve any risk to life.'

"Such conclusions are totally at variance with the facts col-

lected by me during the eight years I was surgical registrar at the Middlesex Hospital, and they are totally at variance with all other statistical facts known to me relating to this subject. I can well believe that Mr. Hutchinson has not cared to undertake the herculean task of searching through his note-books of twenty years to arrive at the exact results. But, for this very reason, I maintain that he is bound to be guided by the results of those who, in the interest of medical science, have made these researches. How divergent Mr. Hutchinson's impressions are from the facts collected by me the subjoined table shows. In fifty-four cases the primary disease was removed by operation, as follows:—

Kind of Operation.	Total Cases.	Deaths.	Remarks.
Excised with knife..	16	2	In both fatal cases the operations were very severe, being complicated by excision of the maxilla, and free excision of the infiltrated glands and tissues. In one of these cases preliminary tracheotomy and ligature of the left common carotid; the patient died of exhaustion on the fifth day after operation. In the other case death resulted from pyæmia on the tenth day after operation. The other operations were all through the mouth, and in four the cheek was slit; all of these recovered. Glands were dissected out in four instances, and in one of these cases the inferior maxilla was excised as well.
Excised with scissors.	24	2	In fourteen cases no glands were removed. Two fatal cases belong to this group: one died on the operation-table under the anæsthetic, the other died of pyæmia on the twelfth day after the operation. All these operations were through the mouth. In one of the cases that recovered half the tongue, the whole tonsil, and part of the soft palate were removed; the cheek was slit, and preliminary laryngotomy was done.
Removed with wire écraseur.....	12	5	In seven cases no glands were removed. Three fatal cases belong to this group: one died of pyæmia on tenth day after operation; another died of septic pleuro-pneumonia, with recurrence a month after operation; the other died under chloroform, which was given for arrest of hæmorrhage a few hours after operation. Of the five cases in which glands were removed, one died of septic pneumonia on seventh day after operation, and another of septicæmia on thirteenth day after operation. All of these operations were through the mouth, and none of them were severe, except one non-fatal case, in which the écraseur was introduced through a median supra-hyoid incision.
Destroyed with actual cautery.....	2	Nil.	One of these cases was freely scraped with a sharp scoop as well.
Total.....	54	9	Mortality = 16.6 per cent.

"Any comment is, I think, superfluous; the facts speak for themselves. Those who desire further details will find them in the Middlesex Hospital Surgical Report for 1888."

Herbert Snow, of London, also contributes an interesting letter on the "Lymph-Glands in Tongue Surgery," $\frac{2}{\text{Dec.26,'91}}$ which is the more instructive because of the clearness with which the controverted points are brought out: "In his address on the surgery of the tongue, Hutchinson indicates three regions in which glandular enlargement may occur, namely, beneath the lower jaw, the edge of the sterno-mastoid, and the site of the deep cervical vessels. He affirms that: 'If a gland-tumor appear in one of these regions, it is almost certain that the others will be free;' and, further, that the selection is 'almost a matter of accident.' Now, we know that the lymphatics from the anterior portion of the tongue, from the lips, and adjoining parts of the mouth pass to the lymph-glands under the lower jaw, in contact with the submaxillary; thence the current traverses the superficial cervical lying beside the sterno-mastoid; from these, to the deep cervical in contact with the large blood-vessels. Hence, in epithelioma primarily attacking the parts here indicated, we always find these three sets of lymph-glands enlarge successively.

"On the other hand, the lymph-current from the root of the tongue and from the pharynx passes mainly to the deep cervical glands; a portion from the surface tissue also to the superficial cervical. Epithelioma, commencing here, accordingly implicates secondarily these two sets, sometimes only the deep. The submaxillary lymph-glands now always escape infection,—that is, until a very late stage,—and those at the edge of the sterno-mastoid may do so.

"This, I presume, is what Hutchinson really means when he states that the three sets are seldom found simultaneously enlarged. But the infection obviously extends from the primary site upon strictly-defined anatomical principles. In the present and in similar instances of malignant disease no caprice or 'accidental' distribution of secondary deposits in the lymph-glands ever becomes apparent until the remoter stages of the malady, when we have to reckon either with a general blood-infection under some circumstances, or, under others, with a complete occlusion of the ordinary lymph-channels, diverting the lymph-currents into various abnormal directions.

"With the admission of 'accident' as a prime mover in such cases of lymph-gland infection, all surgical measures addressed to

these latter organs become aimless ramblings in the dark. A recognition of the definite path along which the infective particles of a cancerous new growth in the early days of the malady diffuse themselves appears to me the most important point, by far, in the surgery of malignant disease. In every case, with the rarest possible exceptions, amenable to surgical treatment, the lymph-glands, in which the deposit will first betray itself, can be accurately predicted. These duly enlarge; but enlargement is a *late* symptom, and is almost certainly indicative of sundry cell-collections lurking in other similar organs, yet still of normal size. Even when limited to a single lymph-gland, it vastly lessens the hope of complete eradication. In waiting for its appearance, therefore, before we act, we seriously imperil the best interests of our patient. The principal aim of the surgeon who seeks to extirpate cancerous disease secondarily implicating the lymph-glands should be the operative removal of all such as are known to be in danger of infection before enlargement has had time to take place."

The subject was also thoroughly discussed by the American Surgical Association, at the meeting held in Boston, May 31, 1892. A paper by Dandridge, of Cincinnati, $_{\text{June 16}}^{99}$ was confined to a consideration of operative procedures in malignant disease. As a rule, it appears in the form of epithelioma, and runs its course in about a year and a half. In many cases it develops from an indifferent lesion, which has been subjected to continued irritation. Neighboring glands are usually affected; and this may occur within three months, or not for six or nine months, after the appearance of the disease. In ulcerated epithelioma the diagnosis will most often waver between that and tubercular or syphilitic ulcer.

The author expressed his agreement with the following propositions laid down by Treves: 1. The organ should be removed by cutting with the scissors or knife. 2. The removal should, as a general rule, be effected through the mouth. 3. Every means should be taken to reduce the hæmorrhage to a minimum. 4. When the floor of the mouth is involved, or the glands extensively involved, the incision should be carried out through the neck.

Whitehead's, Mordant's, Baker's, Kocher's, and Volkmann's operations, all of which have been described in previous issues of the ANNUAL (in this department), were given in detail.

In the after-treatment of removal of the tongue for cancer,

the three cardinal rules are: (1) let the patient be well fed; (2) let all discharges escape from the mouth; (3) keep the cavity of the mouth sweet and clean. Dandridge next referred to the palliative treatment to be employed in cases where operation was not indicated, or where the patient refused surgical interference. For the pain, a powder, consisting of iodoform (1 grain—0.065 gramme), morphine ($\frac{1}{6}$ to $\frac{1}{2}$ grain—0.011 to 0.032 gramme), and borax (3 grains—0.19 gramme), has been recommended, applied directly to the painful spot. Cocaine has naturally been resorted to, either by application to the surface or by hypodermatic injection; but there is danger of the establishment of the cocaine habit. The excision of a portion of the lingual nerve was highly recommended, but the relief thus afforded may be only temporary. For the relief of salivation and fœtor various antiseptic mouth-washes may be employed. Where there is difficulty in swallowing, on account of the pain, relief may be afforded by painting the surface freely with cocaine just before the administration of food, or a soft-rubber tube may be passed into the œsophagus.

The following conclusions were considered justified: 1. Sufficient experience has been accumulated to show that the removal of cancer of the tongue prolongs life and adds to the comfort of the patient; and, further, affords a reasonable hope of a permanent cure. 2. All operations should be preceded by an effort to secure thorough disinfection of the mouth and teeth. 3. In the treatment of continued ulcers and sores on the tongue, caustics are to be avoided and all sources of irritation removed. 4. Persistent sores on the tongue should be freely removed by knife or scissors, if they resist treatment. 5. When the disease is confined to the tongue, Whitehead's operation should be employed for its removal. 6. In this operation the advantage of preliminary ligation of the lingual artery is not definitely settled, but the weight of authority is against its necessity. 7. The advantage of leaving one-half the tongue in unilateral disease must be considered undetermined; but the weight of positive experience is in its favor. In splitting the tongue into lateral halves, Baker's method of tearing through the raphé should always be employed. 8. A preliminary tracheotomy adds an unnecessary element of danger in the removal of the tongue, in ordinary cases. 9. When the floor

of the mouth has become involved, or the glands are enlarged, Kocher's operation should be employed, omitting the spray and preliminary tracheotomy. 10. Removal of the glands by a separate incision, after the removal of the tongue, must be considered insufficient. 11. Volkmann's method still rests on individual experience. Its just value cannot be determined until it has been subjected to trial by a number of surgeons. 12. Thorough and complete removal should be the aim of all operations, whether for limited or extensive disease. 13. By whatever method the tongue is removed, the patient should be up and out of bed at the earliest possible moment, and should be generously fed.

In the discussion, D. W. Cheever, of Boston, referred to the diagnosis of ulcers of the tongue. 1. Dyspeptic ulcers: These appear in successive crops. They are not indurated, and can be made to heal by simple treatment. 2. Syphilitic ulcers: Previous history is at times of service. In doubtful cases two weeks of antisyphilitic treatment should be employed. 3. Lupus or tubercular disease: This is not so common as cancer. The test of the examination for the bacillus is not always successful. The tubercular ulcers form and reform; some heal and leave scars. Cancer does not heal, but goes on extending. In lupus the sublingual and submaxillary glands are early infected. True cancer is almost always at the side of the tongue; the infection of the glands is usually speedy. While Cheever advised removal of enlarged glands, he did not think that the neck should be treated as the axillæ. As to duration, he thought that malignant affections of the mucous membranes are more speedy in their recurrence than malignant affections in the skin and glandular structures. In cancer of the tongue the disease, as a rule, recurs in from four to six months. In simple cancer of the tongue, without gland involvement, preliminary tracheotomy is not needed. He operates with the patient in the sitting position and not thoroughly etherized. He had never tied the lingual artery for cancer. Partial amputation of the tongue, where the disease is limited, seems to have been as successful as the total removal. Recurrence is almost always in the glands and rarely in the stump. Reference was also made to the remarkable recovery of the power of talking in cases where the tongue was completely removed.

L. McLane Tiffany, of Baltimore, said that, in considering

operative interference, we should distinguish between cases where the disease involved the anterior portion of the tongue and where the disease has begun more or less posteriorly and there is glandular involvement. In the latter case he prefers division of the lower jaw, either at the symphysis or at the side. He thought it wise to remove the glands beneath the tongue, even if not enlarged. In this way we get rid of one of the routes of systemic infection. Where the posterior portion of the tongue is involved, permanent recovery is rare; where the glands are involved, it is still more rare. He had obtained his best results where he had divided the jaw and secured drainage from below. The incision is not closed, and ample opportunity for drainage is provided. The operation is done with the patient on the side and the head near the edge of the table, full anæsthesia with chloroform being employed. Where the tongue is excised for tubercular ulceration the ulcer rarely recurs, although the general tubercular disease may progress.

T. F. Prewitt, of St. Louis, remarked that where the cancer is limited to the tongue an operation through the mouth is sufficient. If the floor of the mouth be involved and the disease extend out to the bones, something more is needed. In one or two instances he had resected portions of the jaw. He did not think that the primary hæmorrhage was to be dreaded, but he had seen death from secondary hæmorrhage in a case of diseased arteries.

W. H. Carmalt, of New York, had found a great deal of advantage from preliminary tracheotomy. The most frequent cause of death after operation is septic pneumonia from the inhalation of septic material. Tracheotomy not only facilitates operation, but it obviates the danger of septic pneumonia. In his last case he had operated, doing tracheotomy and packing the fauces. The patient did well. At the end of four days he removed the tracheal tube and allowed the patient to breathe by the mouth. The next day the temperature was up to 102° F. (38.9° C.). The tube was immediately re-introduced and the fauces packed, and in twenty-four hours the temperature was again normal. In cases where the glands are involved he advised the Kocher operation. In regard to after-treatment, he had found that patients bear the presence of the œsophageal tube better than its re-introduction.

R. F. Weir, of New York, had removed the tongue five times

by the Whitehead operation and five times by the Kocher operation, and had removed one-half the tongue ten times by Whitehead's operation. Where the floor of the mouth or the glands are involved, he prefers Kocher's operation. He considered it good surgery, where there were signs of glandular enlargement in the submaxillary space, to cut down in front of and behind the sternomastoid muscle and examine the condition of the lymphatic glands in this situation. In the Kocher operation he prefers tracheotomy, and does it a few days before if there is sufficient time. He considers it a great advantage, both at the time of operation and afterward.

A. G. Gerster, of New York, had extirpated the tongue in various ways in nineteen cases. He thought that the more thorough and radical the operation, the better were the results. He advocated removal of the affected glands and the use of trache otomy. This enables the operation to be performed more thoroughly, with more comfort to the surgeon and less danger to the patient. In this region, as in every other region of the body, thorough operation requires thorough anæsthesia.

T. J. Dunott, of Harrisburg, reported a case where the tongue was greatly enlarged and protruded from the mouth. The operation was done several years ago and the patient is still living and well. Jos. Ransohoff, of Cincinnati, reported one case on which he operated by the Mordant-Baker method, four and one-half years ago, and there had been no relapse. In other cases on which he had operated he had not obtained the same success. In every case where he did not do a Kocher operation he made an incision in the submaxillary triangle, in order to put in a large drainage-tube reaching to the floor of the mouth. This opening gives an opportunity for the examination of the glands. If there be enlargement, the gland can be turned out or the incision enlarged, if necessary.

At a meeting of the Berlin Laryngological Society, June 26, 1892, Scheier [69 July 21] reported three cases of carcinoma of the base of the tongue in old men, observed in the course of a few months in the wards of the Berlin City Hospital. He believes that carcinomata involving the base of the tongue are found so rarely reported in literature because cancers in this locality are not suitable for operative treatment and are, therefore, not published.

The prolonged non-recurrence of cancer of the tongue after ablation is thus commented upon by a Paris correspondent $^{6}_{\text{Mar.12}}$: "Some years ago, A. E. Barker undertook researches into the results of removal of the tongue for epithelioma, and found that out of one hundred and seventy cases only seventeen remained free from recurrence one year after the operation. A patient of Christopher Heath actually remained well for ten years after a very radical operation. Any such exception to the general rule is, therefore, worthy of record, and the following facts will be found interesting, emphasizing as they do the importance of removing any enlarged glands that may be found in the neighborhood of the affected organ. On February 10th Quénu presented a patient, a gardener, whose tongue had been removed by him in its entirety four years ago, for epithelioma. No signs of any return of the disease are now recognizable. On February 17th Jalaguier spoke of a patient of his, aged 68 years, who, being affected with cancer of the tongue, with adherence to the lower jaw, underwent, on August 6, 1888, the following operation: Excision of half of the diseased organ, of half of the jaw, the submaxillary gland, and of two lymphatic glands. Cicatrization occurred in six weeks, and the patient, who sends an annual report of his condition to Jalaguier, has remained free from any return of the disease since."

Sarcoma.—M. Scheier, of Berlin, $^{4}_{\text{No.24}}$; $^{13}_{\text{Aug.15}}$ gives the detailed history of a patient, aged 28 years, suffering with primary lingual sarcoma, which rapidly caused death by relapse, in spite of extensive operation. The microscopical examination of the tumor showed a small and round-celled sarcoma. The occurrence of lingual sarcoma is not limited to age or sex. In half of the cases it occurs before the thirtieth year. Its etiology completely baffles our knowledge. Regarding the seat of the neoplasm, it seems that sarcoma appears frequently in the posterior part of the tongue, in which cancer is seldom found. The objective characteristics are quite varied. The tumor usually develops in the muscle-substance, be it submucous or intra-muscular. Ulceration is rarer than in carcinoma. The size is extremely variable, the microscopic character mostly that of a small and round-celled sarcoma. The clinical symptoms offer nothing characteristic of the neoplasm. The secondary swelling of the glands seems to occur very late. In regard to the frequency of recurrence or metastatic

deposits, we find that recurrence has been observed seven times in seventeen operated cases. Formation of metastatic deposits appeared only in three cases. A sure diagnosis of lingual sarcoma can hardly be obtained except by "test-excision" and careful microscopical examination of the excised pieces. The differential diagnosis between sarcoma and gumma is frequently impossible, even by microscopic examination of excised fragments; in such cases an energetic syphilitic treatment is first indicated. The prognosis does not, according to present experience, appear to be as unfavorable in lingual sarcoma as in lingual cancer. The only treatment consists in a removal of the tumor as early and as thoroughly as possible.

A Modification of the Operation of Partial or Complete Excision of the Tongue.—Lane, $\frac{1}{\text{Aug. 27}}$ in the case of removal of half of the tongue, suggests suturing the cut margin of the mucous membrane on the dorsum of the tongue to the edge of that covering the floor of the mouth, so as to leave no raw surface uncovered by mucous membrane. When it is necessary to remove the body of the tongue, after carefully defining the extreme limits of the growth and giving it a wide margin, a large flap of the mucous membrane with a substratum of muscular tissue is sliced off from that portion of the tongue which is of a certainty free from the growth, and this flap is sutured accurately to the free margin of the mucous membrane in the floor of the mouth and to that covering the root of the tongue, so as to cover the entire raw surface. Probably this procedure, or one very similar, is familiar to some surgeons, but it certainly is not to all. It appears to be practicable in many, if not in all cases, and, when practicable, it promises great utility. This method constitutes one of the features of Péan's and Maunsell's methods of extirpation of the tongue, which have already been referred to in previous issues of the ANNUAL.

Malignant Neoplasms in Children.—Stern, $\frac{69}{\text{No. 22; }}\frac{11}{\text{July}}$ of Düsseldorf, reviews the cases of malignant neoplasms in early age. Of interest is the case of a child, 4 years old, in whom the author extirpated a neoplasm of the size of a hazel-nut from the tongue. The microscopic examination showed it to be a sarcoma fusiforme.

FACIAL SURGERY.

Rhinoplasty.—Contributions of unusual excellence and practical value have been added to the literature of the cosmetic sur-

gery of the nose during the past year. Prothesis and operative surgery have equally enjoyed distinction, and the advance made in both of these fields of operative work point to future possibilities hitherto unsuspected in the history of rhinoplasty. The following abstracts from leading contributions will confirm this impression: "On Transplantation of Skin-Flaps from Distant Parts by Wolff's (Berlin) Method," by Antonio Ceci, of Genoa. $^{2}_{\text{Apr.16}}$

This contribution is admirably illustrated. Wolff's method of grafting has been frequently referred to and described in previous issues of the ANNUAL (see this department for 1891, 1892), and we merely give the modifications suggested by the author: "1. In gradually reducing the number of sutures I have at last given them up altogether, finding that the flap adheres like sticking-plaster. 2. Instead of transplanting the skin at once after preparing the surface, I find it better to allow two or three days to intervene. This is especially imperative when arteries have been tied, because these bits of sloughing tissue may have a septic effect upon the transplanted flaps. 3. To obviate the objection of cutting an irregular flap to the required shape and measure, and thus leaving a granulating sore on the arm, I remove it in a straight line, whereby I obtain a linear cicatrix. Of seven cases on which I operated by this method, and which I reported to the International Congress, in Berlin, one was nearly a complete failure, but the skin-flap was one of very large size, measuring ninety-six centimetres, taken from a freshly-amputated limb, to cure an ulcer of the foot and leg.

"Notwithstanding that the flaps transplanted by this method undergo contraction of its surface in the lapse of years, they always remain unlike a cicatrix. Besides, we find in other plastic operations, when the flap is taken from distant parts, according to Tagliacozzi, or by migration (*Wanderlappen*, von Hacker and Obalinski), that it undergoes a slight process of shrinking in course of time. I think, therefore, that Wolff's method is admirably adapted to plastic operations on the forehead, the cheeks, the surface of the cranium, and on the nose, when the bones are intact, in which regions it forms sufficient cutaneous protection, and shows little tendency to subsequent retraction."

Matti Äyräpää, of the University of Helsingfors, Finland,[2168] in an essay on the treatment of saddle-nose, gives a thorough

history of rhinoplasty; the chief value of the paper, however, lies in the author's original adaptation of prothesis to nasal cosmetics. In this respect the work of the Finnish dentist is deserving of great credit, and reminds us of the admirable contribution, on the same subject, by Martin, of Lyons, which has already been referred to in this section of the present and previous issues of the ANNUAL.

"For the success of rhinoplasty a firm scaffold, upon which the new nose may be built, is absolutely necessary; and this scaffold must, in conformity with the natural conditions, consist of a vertical column and a roof-part. Whether it be possible to procure a sufficient equivalent for the protective scaffold by the implantation of a thin fronto-periosteal flap, as obtained by König's method, or whether this kind of support will not sink with time, only experience can tell." The author considers the value of an artificial support in the correction of sunken nose, and discusses his own method, as applied in twenty cases. In his reports we must distinguish two groups of cases: One without defect of the dermal covering, in which he reconstructs the lowered bridge of the nose merely with prothetic agents; the other, cases with loss of the skin-covering, in which his prothetic apparatus simply serves as a skeleton preceding or succeeding rhinoplastic operations.

Äyräpää makes his patients (who suffer with concomitant palatine perforation) wear a plate of hard rubber, on the upper surface of which an artificial nasal diaphragm is placed. The latter is, according to the peculiarity of each separate case, either a perpendicular lamella of hard rubber, imitating in form and size the lost vomer, or (when the palate is not perforated) a round, strong platinum wire. The prothetic treatment offers no difficulties if there be a wide opening in the median line of the hard palate. The whole apparatus may then be manufactured of one piece of hard rubber. He has lately made the upper part of the artificial diaphragm, which rests against the bridge of the nose, of soft rubber, in order to obtain a softer pillow for the sensitive cicatricial tissue of the interior of the nose.

If there be no opening in the hard palate, the treatment is somewhat more complicated. In such cases the author bores a hole through the hard palate a little to one side of the median line, about two centimetres behind the row of teeth, and establishes thus a connection with the nasal cavity large enough to admit a

strong platinum wire. This platinum wire is fixed to a palatal plate and forms the supporting column for the second part of the prothesis, the nasal scaffold proper. The latter is manufactured from casts, which are procured from the interior of the nose by means of heated gum, is made of soft elastic rubber, and consists of a longitudinal piece which runs along the bridge of the nose, and two cross-pieces, which support the alæ. This apparatus, which can be easily modified according to circumstances, is insinuated into the nose and held in place by the platinum wire entering the nose from the direction of the palatal plate. The prothetic apparatus consists, therefore, of two separate parts, which are complementary to one another. The apparatus may be worn day and night, but must be taken out daily for the cleansing.

If the patient will not consent to the drilling of the palate, the support of the nose is attempted by hollow spring cylinders of soft caoutchouc, which press against the floor and the alæ of the nose. The profile of the nose is by this method somewhat raised, but its form remains broad and ugly, because the bridge is not raised in proportion to the expansion of the alæ. The histories of the patients, represented by numerous illustrations, show first that patients endure this kind of prothesis without any difficulty, and, second, that even greatly deformed noses are made more presentable by this method.

A modified method of rhinoplasty in the treatment of saddle-back nose is reported by J. Israel, [69 Jan.14] who compared the method of Wolff with his own, and endeavored to prove that Wolff's operation for saddle-back and "pug" nose was (at least) not superior to his. He presented two patients, one illustrating his (Israel's) original operation, and another operated upon by a later (hitherto unpublished) modification of the first operation. The first patient had been operated upon in 1886, exactly five years before, and had not changed in appearance, as could be verified by those who remembered his picture in the author's paper. [226 v.32,No.2] Notwithstanding the excellent result, there were some defects which the author sought to remedy in subsequent operations. The more prominent of these were: 1. The too direct projection of the nose from the forehead, and absence of the normal depression below the glabella. 2. Too great a breadth of the bridge. 3. The existence of a cicatricial covering to the nasal bridge instead

of a true skin covering. In his first operation, Israel dissected a rectangular periosteal bone-flap, seven millimetres wide, from the forehead, which was turned down on the nose so that its raw bone surface looked up and the skin down. In this position the flap was sutured to the soft parts of the tip of the nose, which had been detached by a *transverse* incision from the depressed nasal bones. The raw surface of the flap was now allowed to heal by granulation and cicatrization. The sides of the new nose were subsequently formed by cutting two rectangular flaps from the old sunken nose. This was done by making a median nasal incision terminating in a lateral bifurcation, which allowed the flap borrowed from the forehead to be grafted between the two lateral dissected flaps. In order that the cicatrized forehead-flap may unite to the two lateral flaps, it is necessary that two little skin flaps be dissected backward from the osseous portion of the transplanted flap, so that the opposing raw surface may be brought in contact and sutured.

This operation has been modified by the author in three ways: 1. The osseous portion of the transplanted forehead-flap is diminished by chiseling less, but the breadth of the skin portion is increasd; the object of the modification is to be able to borrow enough material to form a new bridge and then dissect from it suitable lateral flaps, which, after being dissected out, will offer an excellent support to the lateral flaps. 2. The pedicle of the forehead-flap is buried between the lateral flaps, after three weeks, in an incision in the median line of the sunken nose. This will allow a curve to be formed from below the glabella, and more normal appearance will be given to the organ. 3. The raw bone surface of the forehead-flap, which was formerly allowed to granulate, is now covered completely by sufficient skin from the lateral nasal regions.

In addition to his three cases of partial rhinoplasty for saddle-nose, he showed one patient upon whom he had operated upon two years previously, for lupus. The result was an excellent one in every sense. The bridge was bony and solid, and there was no shrinking.

In the discussion that followed, J. Wolff admitted that the first case that he had presented to the society, and upon whom he had operated by his special method for the correction of saddle-

back nose, had been followed by results that were inferior to those obtained by Israel. Nevertheless, this past failure did not militate against the success of the *method*. The speaker had failed because of defective technique, but, since he had applied the principles better, had obtained results which compared not unfavorably with the methods of König, Rotter, or Israel.

Wolff's method of rhinoplasty for "saddle-back" nose, as described by himself, consists in the formation of two flaps: 1. One (*à la* König) borrowed from the forehead; this flap is narrow and is dissected from above downward with its pedicle attached at the glabella; when dissected out it must be reversed and thrown down so that the raw surface looks up and the skin down. 2. Another flap is dissected up from the lower border of the "saddle," and is prolonged as a tongue-like slip corresponding to the bridge of the nose and is reflected down. 3. The forehead-flap (osteoplastic) is now drawn down and covered over with the lower or nasal flap so that the two dissected raw surfaces shall be in conformation. 4. After the adhesion of the two raw surfaces has been assured, the pedicle of the forehead-flap is cut off. By this method the hollow of the "saddle-back" nose is filled up and a more dignified outline is given to the nose.

Diakanow $^{21}_{\text{May 23}}$ offers a modification of König's method. The incision for the mobilization of the lower half of the nose is made in form of a Λ from the root of the nose downward; this flap is dissected off the periosteum and König's flap of the forehead fixed mainly under it. The author reports a favorable case in which, besides providing for the restoration of one of the alæ of the nose, the flap of the forehead was furnished with a horizontal periosteal flap one centimetre long. This method reminds one of Wolff's method just referred to.

"The Cosmetic Surgery of the Nose" is the title of a short and practical paper by Roberts, of Philadelphia, $^{61}_{\text{Aug. 20}}$ who believes that nearly all undesirable distortions of the nose can be improved or entirely corrected by cosmetic operation. Much can be done to the nose, through the nostrils or mouth, without making an incision in the skin of the face. Cuts on the cutaneous surface are inconspicuous, or even invisible, when made in selected spots and with oblique division of the tissues, and when so treated primary union is secured. Such incisions should be made in the

normal lines of the skin, not across them, or should be placed in the situations where shadows, rather than strong lights, usually fall. Careful asepsis or antisepsis, oblique incision of the skin, fine catgut sutures, and iodoform, with collodion as a dressing, insure unnoticeable scars, even when the incisions are made in less desirable sites than those just mentioned. It should be a rule of practice to give all patients with stationary or chronic ulceration of the interior or exterior of the nose full doses of mercury and iodide of potassium. This therapeutic test, carried on for ten days, will usually clear up doubtful cases, if sufficient doses of the drug be given. Congenital imperfections, such as epicanthus and the flattened and dilated nostril accompanying harelip, can usually be greatly improved. The Roman nose, the Jewish nose, and the nose with an angular prominence on its dorsum, in many instances can be satisfactorily modified by careful chiseling away of the angular projection of bone and cartilage. Here a single incision along the edge of the dorsum allows the surgeon to stretch the skin open, so as to apply a sharp chisel to the whole breadth of the nose and shave the bridge into a becoming shape. "I have found that the chisel often does best work when used with the beveled side of the cutting-edge toward the bone. Fractures make, of course, all forms of irregularity, and may be accompanied by such blocking up of the nostrils as to require quarrying with chisel and burrs to open the air-passages.

"I have seen ugly twists given to the cartilaginous nose by what seems to be an interstitional overgrowth of the triangular cartilage of the septum. As this cartilage abuts against bone above and below, such overgrowth causes marked curves in its outline, which secondarily displaces the cartilaginous portions of the external nose, giving it an ugly twist. Efficient treatment of this abnormal shape of the organ must include excision of a considerable portion of the septal cartilage. Sometimes, but not always, this may be done by submucous resection. Tumors involving the tip of the nose can be readily removed by a V-shaped incision; the nasal lobule is afterward reconstructed by bringing the flaps together in a judicious manner. The fact that the nares are laid open by the incision makes no difference. The wound can be protected from septic infection by thoroughly cleansing the mucous membrane before operation, and plugging with antiseptic gauze after operation.

The improvement in the patient's appearance made by excision of tubercular excrescences of the nose due to acne is most astonishing. Chiseling loose the nasal bones and pinching them together toward the middle line will elevate the bony dorsum in saddle-back nose, and, by narrowing it at the same time, give it a relative height which will lessen deformity. The straightening of crooked noses can be accomplished only after very free separation of the cartilage and skin from the nasal and superior maxillary bones. This is best done with a tenotome passed into each nostril in turn. With it the mucous membrane is pierced and the tissues freely cut away from their bony attachments. The septum is then divided by knife or saw, and the nose forcibly bent into the straight position. A great deal of force should be applied so as to twist the parts completely out of their abnormal relations. It is always well to overcorrect the distortion, because there will be a tendency of the old condition to return. If the nose be bent to the right, the surgeon should give it a marked twist to the left of the middle line, and similarly to the right in left deviations. After this has been done, steel pins, one and one-half inches long, are thrust through the skin just below the nasal bones and through the columella at the margin of the anterior nares, and used as levers to hold the nose in its corrected position. The pins should be retained about ten days or two weeks."

At a meeting of the New York Academy of Medicine, $\frac{1}{\text{Jan. 9}}$ Powell, of New York, discussed the Thiersch method of grafting in plastic operations on the nose. He presented a female patient, upon whom he had operated for vascular papilloma springing from the nose. Three fresh grafts had been taken from the arm and the wound had healed throughout. On previous occasions the speaker had applied a single large graft in regions where the skin could not be approximated, and twice these grafts had failed to catch. He could only account for this by the assumption that the ligatures used had interfered with the blood-supply. He thought that where a single large graft would catch, the cosmetic effect was better. When the graft was taken from the arm, it was introducing a skin different in color from that at the site it was to occupy.

Äyräpää, of Finland, $\frac{226}{\text{v. 43}}$ used frogskin-grafts in a case of rhinoplasty. The patient, 21 years old, had both nostrils closed by granulations and cicatrices, in consequence of ulceration from

small-pox in childhood. After cocaine anæsthesia, Äyräpää divided the cicatricial tissues, which were almost as hard as cartilage and bloodless, and inserted rubber tampons. Four days later he enlarged the openings, which were somewhat too narrow, and substituted larger tampons. The patient objecting to a skin-transplantation according to Thiersch's method, and her own skin being covered with pock-marks, Äyräpää used very small grafts from the abdomen of a common frog. Five days later, when the tampons were removed, all the transplanted pieces had adhered, and the pigment of the grafts had disappeared.

Under the title "A Facial Deformity Vulgarly Known as 'Menton de Galoche' and its Correction by Orthopædic Apparatus," Magitot $\frac{100}{\text{May } 24}$ describes a deformity consisting of a projection forward of the lower incisor teeth and jaw beyond the upper, in extreme cases the chin being carried sufficiently far forward to be in line with the tip of the nose. The face in profile thus approaches the senile type, constituting a vicious deformity, which in the female is peculiarly conspicuous. This condition is hereditary in some families, and appears to be due to a premature fusion and ossification of the intermaxillary bone, which results in an arrest of development of the upper jaw. The inferior maxilla develops normally, and gradually advances, to project beyond its fellow. The deformity may exist from birth, but is usually most noticeable about the seventh or eighth year, at the period of second dentition. The treatment is very satisfactory, and in patients below adult age results in complete and speedy relief of the deformity. A vulcanite plate is molded accurately to the teeth of the lower jaw, and in its upper surface is imbedded an inclined plane of gold or platinum, so arranged that the upper incisors impinging upon it are directed strongly forward. The plate is worn constantly, day and night. As the teeth are carried forward, the alveolar process of the upper jaw advances with them, and the line of the upper lip is made to correspond with that of the lower.

The author reports a pronounced case cured by this method in eleven days, and concludes as follows: 1. The facial deformity known as *menton de galoche* is susceptible of a complete cure by orthopædic treatment. 2. The apparatus to be used is the inclined plane first described by Catelan in 1809. 3. Its application is attended by no discomfort or complications. 4. The duration of

treatment is proportional to the youth of the patient and the muscular energy employed. The limit of the utility of the apparatus, without being definitely fixed, seems to correspond to adult age in the patient.

A rare case of plasty in the face is reported by Crédé, of Dresden, $^{226}_{B.43,H.3,4}$ in which he performed forty plastic operations (!) in twenty-two different sittings for a most severe injury, by burn, of the face in a boy $5\frac{1}{2}$ years old. The operative result obtained by several years' work must be regarded as excellent when we consider the extensive destruction of the tissues and the functional as well as cosmetic disturbance.

Other papers of interest in connection with the plastic and reparative surgery of the face are: "On the Formation of Bridge-like Flaps from the Skin Beneath the Chin to Cover Defects after Extirpation of Carcinoma of the Lower Lip," by E. Reynier $^{336}_{May\ 28}$; "On Autoplastic Operations for the Relief of Mutilations and Cicatricial Deformities," by Schwartz, of Paris $^{100}_{Dec.22,'91}$; "Two Cases of Angioma of the Face," by Péan, Hôpital St. Louis, Paris $^{100}_{Nov.19,'91}$; $^{451}_{Feb.}$; "Deformity resulting from Extensive Traumatism of the Face from Gunshot Injury, Corrected by Plastic Operation," by Albert, of Vienna $^{57}_{July\ 3}$; "Rhinoplasty after Extirpation of Hypertrophic Acne Rosacea," by Delie, of Brussels $^{136}_{July\ 15}$; "Rodent Ulcer of the Face," by Buchanan, of Glasgow $^{213}_{Feb.}$; "Rodent Ulcer extending from the Face into the Superior Maxillary Bone" $^{11}_{Aug.9}$; "Epithelioma of the Face," by Forestier, of Aix-les-Bains $^{7}_{May\ 13}$; "An Attempt at a Partial Restoration (Readjustment) of the Bones of the Face after Injury," by Gayet, of Lyons. $^{3}_{Jan.13}$

SURGERY OF THE TRIGEMINUS.

The operative treatment of neuralgic affections of the fifth pair has received an unusual degree of attention on the part of operators throughout the world, and the progress accomplished has been so great during the last five years that further advance in this line is well-nigh impossible. Under the ægis of asepsis, and greater experience in endocranial surgery, the technique of trigeminal neurectomy has advanced further and further, until, penetrating into the base of the *brain* itself, it has culminated in probably the boldest, if not most adventurous, operation of the century,—the avulsion of the trigeminus directly from its origin in

the pons Varolii. This operation, which was performed by Horsley, of London, December 11, 1890, on a woman aged 66 years, is the most memorable in the annals of trigeminal surgery, because it realizes the final anatomical limit of operative intervention in the treatment of this condition.

This brilliant but unfortunate case is reported in detail in the paper by Horsley, assisted by Taylor and Colman, on "The Various Surgical Procedures Devised for the Relief or Cure of Trigeminal Neuralgia (Tic Douloureux)," [2] Nov.28,Dec.5,12,'91 which was referred to in the ANNUAL for 1892.

This series of papers, together with the three Lettsomian lectures "On the Surgical Treatment of Trigeminal Neuralgia," subsequently delivered by Wm. Rose, of King's College, London, [6] Jan.9,23,Feb.6 constitute the *pièces de resistance* of the current literature on this subject from the date of this publication. In both contributions the historical evolution of the subject is carefully presented and discussed, and most of the methods of operative treatment, previously recommended, are passed in detailed review. Nothing strikingly new is presented by either author in the technique of the excision of the ophthalmic branches. In dealing with neuralgia of the second division, Horsley distinctly prefers (as a primary operation) the operation of Carnochan, as modified by Chavasse, which greatly resembles Wagner's operation. In this the eyelids are stitched together as a preliminary precaution. His incision is a semilunar one along the inferior orbital margin, with a vertical one placed at right angles to it over the infra-orbital foramen, and about three-quarters of an inch in length. The flaps thus marked out are raised from the bone, including even the periosteum. The orbital tissues are now freed from the bone; and emphasis is laid on the fact that, if the orbital periosteum be maintained whole and unbroken, the orbital fat is not seen and does not protrude into the wound. The canal is laid open with a fine pair of bone-forceps, and, as a rule, the antrum remains intact. Should it be accidentally opened, the cavity is to be filled with powdered boracic acid. No interference with the healing of the wound is to be expected. The nerve is freed as far as the foramen rotundum, and there divided.

Rose, while not committing himself to any special method for the neurectomy of the second division, appears to favor the Lossen-

Braun or pterygo-maxillary operation for the resection of this division, though he has no personal experience with it.

The third division of the trigeminus can best be reached and excised on a level with the foramen ovale, according to both Horsley and Rose, by the modification of Velpeau's operation, introduced by the former operator. This method essentially consists in trephining the lower jaw over the foramen of entrance of the inferior dental with a three-fourths inch trephine, and enlarging the opening thus made by removing the bridge above that separates it from the sigmoid notch by cutting-pliers, and thus enlarging the space between the condyle and coronoid process sufficiently to allow the inferior dental and lingual nerves to be exposed up to the foramen ovale, when the whole trunk is cut off and over one inch of its length removed.

Intra-cranial operation on the trigeminus and the Gasserian ganglion may be summarized as follows:—

1. *Horsley's Intra-cranial and Intra-dural Operation.*—Division of the nerve at the base of the skull by cutting through the tentorium before its expansion in the Gasserian ganglion, and evulsion of the same from the pons Varolii. The only patient upon whom this operation was performed was the female (case No. 5 of Horsley's table), aged 66 years, who was operated on December 11, 1890, after having undergone two other more superficial operations for the relief of the same condition on May 24, 1887 (removal of the inferior dental), and November, 1889 (removal of the second division at the spheno-maxillary fissure). The final operation essentially consisted in opening up the middle fossa of the skull through the temporal region and raising the temporo-sphenoidal sufficiently, on a spatula, to expose the root of the nerve emerging from the pons, as it lies under the tentorium, which could be traced to the ganglion by section of the dura mater.

"Unfortunately, the patient never rallied from the operation, and died seven hours afterward, obviously from shock. At the autopsy it was found that there had been a slight amount of oozing, but nothing to produce any compression at all. At the moment when the fifth nerve was separated from the pons, though the patient was well under the anæsthetic, there was arrest of the respiration, and the pulse could not be felt. This lasted for probably not more than three to four seconds, and then the respiratory

movement and pulse became normal. In reviewing the result of this operation, I am satisfied that the unfavorable termination was due to the special circumstances of the case, and the considerable series of experiments on the lower animals which have been made, involving the division of the fifth nerve, show clearly that nerve exposure and nerve section are not, of themselves, dangerous to life."

Rose, after extensively commenting on this case, concludes: "From these considerations we cannot resist the conclusion that this (Horsley's) method of reaching the ganglion is scarcely justifiable in the light of present experience, and that, if the ganglion can be satisfactorily reached, and dealt with along some safer route, it is far better to avoid the risks certainly associated with an extensive intra-cranial operation."

Extra-dural Extirpation of the Gasserian Ganglion.—Reference was made, in previous issues of the ANNUAL, to Rose's remarkable and successful operation on this portion of the trigeminus. The first method practiced by him was that of applying a trephine at the base of the skull after excision of the upper jaw (*vide* ANNUAL for 1891). This has been entirely abandoned by the author for his last operation, in which he trephines the base of the skull through the pterygoid region.

Rose's present method may be summarized as follows[6 Feb.6]: The patient is to be carefully prepared by attention to the bowels and general health. The side of the face must be carefully purified, both before and at the time of the operation, by a 1-to-20 solution of carbolic acid; the ear must be cleansed and plugged with gauze, and the conjunctival sac rendered aseptic by washing out with a 1–2000 sublimate solution. The lids are then stitched together. The operation is performed in the following stages:—

Stage I. Incision through the Skin and Reflection of Flap.—The skin-incision is almost semicircular, extending from near the outer canthus about half an inch below the external angular process of the frontal, backward along the upper border of the zygoma to its posterior extremity. The knife is then carried down over the parotid region just in front of the angle of the jaw, and then forward along the lower border of the horizontal ramus as far as the facial vessels. The flap of skin thus marked out can be dissected forward and secured by a temporary suture to the upper part of the chin, where it is protected during subsequent proceed-

ings by a gauze dressing. It is perfectly feasible to dissect up such a flap without encroaching upon the branches of the facial nerve or Stenson's duct.

Stage II. Section of Zygoma and Coronoid Processes and Detachment of Masseter and Temporal Muscles.—The zygoma is now cut down upon by an incision along its course and laid bare by means of suitable raspatories and periosteum detachers. Two holes are drilled at the root of the zygoma, and two also anteriorly through the zygomatic process of the malar. This is best accomplished by a fine drill driven by a dynamo. The drill used should be of such a size that the perforations in the bone may carry a wire of No. 22 gauge, and the holes should be one-third of an inch apart. The bone is then divided between them with a fine saw, and in such a way that the anterior saw-cut is directed obliquely downward and forward, the posterior part of the zygoma being divided as near its root as possible. When the masseter has been drawn downward as far as possible, consistent with the integrity of the important adjacent structures, and a little cellular tissue pulled away, the coronoid process will be exposed, together with the tendon of the temporal muscle, which, it must be remembered, passes lower down on the inner aspect of the process than on the outer. In three of his cases, Rose drilled holes through the coronoid and jaw with the view of re-adjusting the detached portion by wiring, but subsequent experience has led him to discard this procedure and to substitute instead the simple excision of the divided coronoid with a portion of the attached temporal.

Stage III. The Search for the Foramen Ovale.—After displacing the pterygoid fat and cellular tissue, the internal maxillary is discovered between the heads of the external pterygoid muscle and divided between two ligatures. The external pterygoid muscle is next detached from the great wing of the sphenoid and from the outer surface of the external pterygoid plate by scraping it off the bones with suitable raspatories and pushing it downward. The foramen ovale is now to be brought into view,—a matter often of some difficulty,—and occasional reference to a dry skull held by an assistant will be a considerable help in indicating its position in relation to the neighboring landmarks. It is important to define clearly with the finger the outer pterygoid plate, and help may be obtained from the facts ascertained by the measurements of a

number of skulls by Carless, that in an adult male skull the average distance from the anterior border of the outer pterygoid plate (that is, from the posterior lip of the pterygo-maxillary fissure) to the centre of the foramen ovale is about eighteen millimetres, whilst in the female adult skull it is about sixteen and a half millimetres.

Stage IV. Opening the Base of the Skull.—This was accomplished by Rose in his first four cases by removing a disc of bone around the foramen ovale, leaving an opening which was subsequently enlarged. For this purpose a trephine with an internal diameter of half an inch was employed, with a blunt-ended centre-piece which could be well inserted into the foramen. In view of the danger of wounding the Eustachian tube and of septic contamination from the pharynx, this plan was abandoned, and, in the last case dealt with, the trephine was applied a little anterior and external to the foramen, and in such a way that the circumference of the disc just impinged on its outer wall. The opening thus made can be subsequently enlarged, if necessary, in any direction desirable. It must not be forgotten that the thickness of the skull in this position is very unequal, being thinner on the outer margin of the trephine track than on the inner; and inasmuch as the instrument is necessarily applied at an angle, the outer half will be cut through before the inner. This fact renders damage to the dura mater possible unless careful precautions be taken.

Stage V. Removal of the Ganglion.—The trunk or stump of the third division is used as a guide to the ganglion, which should be loosened from its resting-place upon the apex of the petrous bone. No great difficulty will be experienced as regards the posterior half; but inasmuch as the anterior and upper portion is closely incorporated with the dural sheath, it is better to sever the root as far back as possible and then draw the ganglion forward. For this purpose, especially-constructed hooks, one of which has a cutting-edge upon its concave aspect, will be found useful. It is quite possible that, in dividing the root of the nerve, a prolongation of the subdural space may be opened, from which a little cerebro-spinal fluid will trickle. The second division is now searched for and divided, and the ganglion pulled away piecemeal with forceps or with small curette, as recommended by Andrews, of Chicago. No attempt should be made to isolate and divide the ophthalmic division.

Stage VI. Reposition of Displaced Structures and Closure of the Wound.—The coronoid is excised entirely; the zygoma is re-adjusted and wired, and the wound closed with continuous suture. No drainage-tube is necessary, but sponge-pressure should be applied for forty-eight hours. Both eyes should be protected with pads of salicylic wool and lightly bandaged. The dressing has usually required changing once or twice in the first four days, at the expiration of which time it may be replaced by gauze fixed down with collodion.

Results of Operation.—Rose gives a summary of five cases operated on by himself, and two more by Andrews, of Chicago. To this list should be added one more operated on by Emory Lanphear, of Kansas City, Mo., March 29, 1892, $\frac{101}{\text{June}}$ making in all eight cases in which the ganglion of Gasser has been attacked for the relief of neuralgia by Rose's method without a fatal result. The operations of Horsley and of Novaro (*vide* ANNUAL for 1892) are not included in this list, because they belong to an entirely different category, both from a technical and clinical stand-point.

In considering the results of partial or complete removal of the Gasserian ganglion, Rose continues:—

"The first question to be answered is, naturally, what effect has this proceeding upon the brain? Up to the present time (February 6th) we are able to give a satisfactory reply. All the five patients whom I have treated in this way have remained free from the typical and terrible paroxysmal attacks from which they had previously suffered. It is true that my first case was done only twenty-two months ago, and the last one only sixteen days; consequently it is too early to speak with confidence as to the permanent character of the relief; but the outlook is hopeful, and is sufficiently encouraging to lead me to continue in the same line of action. Absolute immunity from any kind of pain can hardly be expected after such a considerable disturbance of the structures at the base of the skull, and for some time there may persist a sore and stiff sensation about the region operated on, as well as pains in the head, but these are not estimated of any moment by patients who have previously suffered such intense agony. The interference with the movements of the lower jaw is undoubtedly inconvenient, and renders the process of mastication a little difficult, but I hope that this may be avoided in the future by the removal of the coronoid process."

Rose also notes the rapid diminution of the large anæsthetic area that follows the operation, "and it would appear that the distribution of sensation is taken up by the neighboring branches, much in the same way as arterial anastomosis takes place in the vascular system. This re-establishment of sensation is a fact which cannot be disregarded prognostically, although it is not necessarily the precursor of relapse.

"The effect upon the nutrition of the eyeball is decidedly serious. In the first case, as is well known, the organ was lost, a result of suppurative panophthalmitis, and in two of the other cases the nutritive state was, for a time, considerably depressed. It is probable that the trophic centres for its nutrition are contained in the upper and anterior segment of the ganglion, and, if this be so, the chances of damaging the eye will be lessened by leaving the posterior intact, even though the trunk of the nerve be divided behind the ganglion."

We have thus far endeavored to describe Rose's operation and results almost in his own language. Now let us see what others, equally authorized to criticise, think of it. Horsley [2] Nov.28,Dec.5,12,'91 briefly disposes of the matter in a paragraph. He says, "I have already shown that the ganglion cannot be wholly removed from its bed, but only a small portion. This (Rose's) operation, therefore, resolves itself practically into section of the branches of the lower two divisions just within the skull."

On the other hand, Rose's first criticism of Horsley's intradural operation, which is quoted elsewhere, likewise summarily disposes of the latter operator's mode of accomplishing a similar result.

Dawbarn, of New York, at a meeting of the New York Surgical Society, March 9, 1892, [1] July 2 has, in my opinion, made a very correct estimate of Rose's operation. He stated that he had demonstrated Rose's operation to his classes last autumn, because it seemed, from the description, so easy; but six cadaveric experiments had satisfied him of its great difficulty and danger. He would consider a revolver-shot into his skull as hardly more dangerous than this operation, which penetrated almost half-way through the head, and within a hair's breadth of the sinus and the deep carotid. The motor portion of the fifth nerve was, of course, first exposed and endangered, underlying, as it did, the

Gasserian ganglion. Indeed, he strongly doubted if, in the living subject, it would ever be possible to be at all sure, at this extreme depth, as to just what tissue was being excised, or to do thorough work safely. Approach to the ganglion by trephining at the side of the skull was, he thought, easier and safer.

Extra-dural Neurectomy of the Second and Third Divisions of the Trigeminus, within the Skull, by Craniectomy in the Temporal Region.—Two operations, of the character indicated by this title, have been performed during the year, which, though identical in principle, and almost the same in technique, have been suggested and practiced by two distant operators, independently of each other. Both operations were boldly conceived and successfully executed. Under the caption, "Intra-cranial Neurectomy of the Second and Third Divisions of the Fifth Nerve; a New Method," Frank Hartley, of New York, $\frac{1}{\text{Mar. 19}}$ reports the case of a male patient, aged 56 years, who had suffered with inveterate prosopalgia for nine years previously, and had already had his infra-orbital and inferior dental nerves extirpated.

"Owing to the previous operations and the involvement of the lingual and auriculo-temporal nerves, I decided to attack the nerve at a point where I could divide the second and third divisions of the fifth nerve completely by one operation. The operation intended was to attack the nerve on the inner surface of the skull, outside the dura mater, to isolate the second and third branches completely, to divide and resect as long a portion as possible.

"The advantages thought to exist in the method over Pancoast's, or its modifications by Krönlein, Crédé, and Salzer, or Lücke's operation, were the easy access to the nerve, the comparatively large field of work, the rapidity with which the operation could be done, and the small amount of hæmorrhage. The disadvantage was the inability to resect as long a piece as could be done by some of the other methods. This disadvantage, I am certain, can be overcome in the future, when the knowledge of the degree of adhesion of the fifth nerve and dura mater is better appreciated. It is not difficult to go beyond the Gasserian ganglion. This I did not appreciate fully before doing the operation on August 15, 1891. The operation performed was one in which an omega-shaped incision was made, having its base at the zygoma,

and measuring a distance marked by a line drawn from the external angular process of the frontal bone to the tragus of the ear. The curved and rounder portion of this incision reached as high as the supra-temporal ridge, the diameter of said circle being three inches. The skin and deeper tissues were cut in the shape of the Greek capital letter omega, a method of incision I first saw recommended by Uhle two or three years ago. This incision was carried down to the periosteum of the skull in all portions of the incision, except in the straight part at the base; the tissues were then retracted and the periosteum divided upon the bone in the same direction and as far as the straight part at the base. With a chisel a groove was cut in the bone corresponding to the divided periosteum. This groove went to the vitreous plate, except at the upper angle over the rounded portion, where it included the vitreous plate. A periosteum elevator was here inserted and used as a lever to snap the bone on a line between the ends of the circular portion of the incision. In this way the breakage occurs along the lower portion of the wound, and a flap consisting of skin, muscle, periosteum, and bone is thrown down, exposing the dura mater over a circular area of three inches in diameter. The middle meningeal artery was then tied, the dura mater was then separated from the bone, and the floor of the middle fossa of the skull was exposed. Broad retractors were used to raise the dura mater with the brain and to expose the foramen rotundum and the foramen ovale. The hæmorrhage was stopped by sponge-pressure. The exposure of the first, second, and third divisions of the fifth nerve, together with the carotid artery and cavernous sinus, was exceedingly good. The second and third divisions were isolated at the foramen rotundum and the foramen ovale, and by slight pressure upon the dura mater it could be stripped from the nerves to beyond the Gasserian ganglion. These were divided with a tenotome at the foramen rotundum and the foramen ovale, and that part between these and a point beyond the Gasserian ganglion was excised. As this amount of nerve is not very great, the ends of the nerves were pushed through the two foramina so as, if possible, to interfere with any reunion. In the retraction of the dura mater, owing to imperfect instruments, the third, fourth, and sixth nerves were somewhat injured. As no bleeding was present, the brain was allowed to fill the fossa. The flap—consisting of bone, periosteum,

muscle, and skin—was replaced. The irregular edge of the vitreous plate, which remained attached to the bone not involved in its flap, acted as a shelf on which the flap rested and prevented the falling in upon the dura mater. The periosteum was stitched, the muscle sutured in place, and the skin sewn with silk. One drainage-tube was inserted at the lower angle; an antiseptic dressing was applied. Time of operation, one hour and forty minutes; the patient was carried to the ward in good condition. Following the operation, August 16th, ptosis of the left upper lid appeared, together with double vision and inability to move the eye. The patient was entirely free from pain and continued to do well for one week."

The patient was discharged entirely well of his wound August 30, 1891. One month later he had also entirely recovered from his ocular troubles, etc.

The other case of "Resection of the Trigeminus within the Skull" was reported by Fedor Krause, of Altona, to the Twenty-first Congress of the German Surgical Association, at Berlin, June 8 to 11, 1892. $^{34}_{\text{July 12}}$ The patient, a woman aged 47 years, had been operated upon by Volkmann for inveterate neuralgia of the second division of the trigeminus, by excising the whole of the maxillary portion of the nerve. Krönlein's operation was subsequently performed by Krause for relapse in the stump and in the inferior division. Another relapse followed not long after, and, after trying all forms of medication, Krause performed the intra-cranial operation here described. An incision was made in the temporal region, involving all the soft parts to the bone, which was also cut through with a chisel, in the manner of a Wagner-Wolff flap. The shape of the incision was pyriform, with the bone directed to the zygoma. The base was three and a quarter centimetres; height, six and a half centimetres; its greatest width, five and a quarter centimetres. The flap was turned down after detaching the bone with a lever, as was done in Hartley's case. The middle fossa of the skull was now opened. The finger and a blunt raspatorium were cautiously advanced within the cavity, while the dura mater was being detached at the same time. The foramen spinosum and the arteria meningea media were reached, but the artery was not touched, because it did not interfere with the neurectomy of the second division, which was the sole object of the

operation. While the nerves and ganglion were exposed, the brain was lifted up on a spatula (three centimetres wide) bent at right angles. If the third trigeminal branch or the Gasserian ganglion is to be exposed by this method, then the ligation of the arteria meningea media becomes a necessity. "The bleeding consequent upon the detachment of the dura mater, even with a blunt instrument, is diffuse, and very disturbing when the nerves are to be resected at so great a depth." As soon, therefore, as the second branch at the foramen rotundum was exposed, Krause interrupted the operation, stuffed the whole cavity of the wound with iodoform gauze, and bandaged it. After five days he removed the packing and dressing under chloroform, and, after again lifting the brain with the spatula, dragged out the nerve from the foramen rotundum and resected it to the extent of about half a centimetre. A strip of iodoform gauze was left between the dura and skull for a few days to facilitate drainage, the extra-cranial end being guided out through a gap left in the osseous portion of the flap. The wound healed kindly, and the patient was entirely relieved of her neuralgia. In concluding, Krause stated that this severe operation was only justifiable under two conditions: 1. All the known sources of relief should have been exhausted; but, above all, the lesser operation for neurectomy should have been tried. 2. The severity of the symptoms should be such, after the failure of all other means of relief, as to justify resort to an operation of this gravity. We see, therefore, that, according to Krause, intra-cranial neurectomy by the temporal route is not always so simple a procedure as it appeared to be in Hartley's case. There is no doubt that chiseling so large an osteo-plastic flap in the temporal region must be a very rough, if not barbarous, operation, and that, unless greater progress is made in the technique of craniectomy, we shall be compelled to relegate the procedure so brilliantly introduced by Hartley and Krause to that extreme class of cases in which the extra-cranial operations on the trigeminus have failed.

Retrobuccal Method of Exposing the Third Branch of the Trigeminal Nerve.—R. U. Krönlein, of Zürich, $\frac{226}{B.43,H.3}$; $\frac{72}{Sept.}$ contributes an article on a method of exposing the third branch of the trigeminal nerve and following it up to the foramen ovale. The following is a summary of his method: The usual precautions having been

taken, a linear incision, coinciding with an imaginary line between the angle of the mouth and the point of the lobule of the ear, is made. This incision penetrates the skin of the cheek and reaches from a point about three-eighths of an inch (one centimetre) behind the angle of the mouth to another point the same distance in front of the lobule of the ear. The subcutaneous fat is divided to an equal extent, the masseter muscle and the mucous membrane of the cheek remaining intact. Next the masseter is severed, except such of it as is covered by the parotid gland. The parotid and Stenson's duct remain uninjured, the latter being parallel to, but at a higher level than, the incision. The base of the coronoid process is now made out, and the muscles immediately over and under it pushed out of the way with periosteal elevators. The process is cut off with strong bone-forceps, the forceps being applied at the base of the sigmoid notch, and cutting obliquely downward and forward. The process is now retracted upward along with the temporal muscle, and the seat of the nerve is exposed to such an extent that all the further steps of the operation can be carried out with blunt instruments. With these instruments the fat constituting the corpus adiposum malæ is removed, as well as the deeper layers of fat which surround the nerves and vessels on the external surface of the internal pterygoid muscle, up to the level of the external pterygoid. In doing this the buccinator nerve must be looked for as it courses downward and forward over this cushion of fat. This nerve is somewhat thin, and may be followed up as far as the external pterygoid muscle. The index finger can now make out the lingual on the inner side of the ramus of the lower jaw, which is the guide to the position and course of the inferior dental and the lingual nerves. It is generally easy to isolate the lingual nerve with the inferior dental lying behind it, and to follow them to the lower margin of the external pterygoid muscle.

By careful, blunt dissection the chorda tympani may be isolated and brought into view, as well as the internal maxillary artery, as it crosses the two great nerves (lingual and inferior dental). In order to follow the nerves to the foramen ovale, and to find the auriculo-temporal nerve, it is necessary to pull the external pterygoid firmly upward, best with a Langenbeck's resection-hook. If the internal maxillary artery is in the way, it may be ligated and divided. The auriculo-temporal nerve may now be found

behind the lingual and inferior dental nerves, surrounding the middle meningeal artery with a loop. By these measures it is possible to follow the third branch of the trigeminal nerve to the base of the skull and resect extensive portions of it. The closure of the wound is carried out on ordinary surgical principles, a few buried sutures uniting the divided portion of the masseter muscle. It is recommended that the coronoid process be restored to and fixed in its normal position. Krönlein has not yet had an opportunity to apply this operation, but recommends its trial in suitable cases.

Other papers of interest in the surgical treatment of the trifacial are: "A Report of an Operation for Removal of the Gasserian Ganglion," by Emory Lanphear, of Kansas City [101 June]; "Two Cases of Removal of the Semilunar Ganglion Through the Floor of the Skull for Facial Neuralgia," by Edmund Andrews, of Chicago, [451 June] previously referred to, which complete the sum total of American clinical contributions to the subject of Rose's operation.

Rudolph Frank [57 June 26] reports "A Successful Resection of the Second and Third Branches at the Base of the Skull by Krönlein's (first) Method." He says, "The only real difficulty in Krönlein's operation lies, in my opinion, in the obstruction to vision caused by the troublesome bleeding at the bottom of the very deep and narrow cavity, where the nerves are to be found. Systematic compression with tampons of dry gauze is the only remedy, though it is possible to find one's way with the finger." [The editor indorses this opinion most emphatically; the only serious drawback to all neurectomies for the third division at the level of the foramen ovale lies in the troublesome bleeding,—not so much the arterial bleeding, which can be checked well enough, but the constant, steady venous flow from the pterygoid plexus and its tributaries. To avoid this annoying complication, the best plan, in a troublesome case, would be to perform the operation in two sittings: In the first, exposing the pterygoid fossa in the neighborhood of the nerves, and applying an aseptic tampon to the wound; the second, twenty-four or forty-eight hours after, would be practically bloodless, and the nerves could be extirpated in a clean and thorough manner and with less shock to the patient. In a recent "Salzer" operation for the neurectomy of the second and third division, the editor had occasion to especially experience the annoyance of this troublesome bleeding, and, though the neurectomy was accomplished very

satisfactorily, he decided to adopt the plan of operating in two sittings in future cases.—R. M.]

In a short note on the "Treatment of Trifacial Neuralgia by Torsion of the Three Main (Sensory) Branches of the Fifth Nerve" (two cases), Wyeth, of New York, [155 July] advocates Thiersch's method of torsion and extraction of the peripheral filaments in preference to the deeper and more serious operations. Of course, this method would be restricted in its application to the purely superficial neuralgias. It could not well be applied to those neuralgias which involve the lingual nerve, etc.

In a note on the "Methods of Stretching or Excising a Portion of the Inferior Dental, Lingual, and Superior Maxillary Nerves for Tic Douloureux," W. J. Walsham, of London, [2 Dec.19,'91] contrary to the opinions of Horsley and Rose, advocates the intra-buccal methods. Other successful neurectomies of the trigeminus, more or less deep and extensive, are reported by Chalot, of Toulouse [3 June 1]; Villar, of Bordeaux [188 Jan.17]; Godlee [22 Apr.2]; Badal, of Bordeaux [70 Feb.28]; Vamossy, "Resection of the Inferior Maxillary by Zuckerkandl's Method" [113 No.48,'91; 242 June]; Pollosson [760 July 2]; Chantre, "Neurectomy of the Infra-orbital" [211 Apr.17]; Noble Smith, of London, "A Case of Spasmodic Action of the Lower Jaw of Six Years' Duration Cured by Operation on the Inferior Dental" [6 Sept.24]; Gärtner, of Wurtemberg, "Resection of the Frontal Division." [133 June 10]

In a valuable contribution on nerve-stretching in inveterate trigeminal neuralgia, James Stewart, of Montreal, Canada, [282 Feb.] concludes as follows: 1. Nerve-stretching gives either complete or great relief in the majority of cases. 2. Relief is not permanent in more than 5 per cent. of cases. 3. If pain should return, the operation should be repeated, even several times, before resorting to a neurectomy or ligature of the common carotid. 4. If the pain is not strictly and always limited to one branch of the nerve, several branches should be stretched. 5. As relief does not always immediately follow stretching, a second operation should not be undertaken until some time has elapsed.

"A Case of Resection of the Lingual Nerve by Neurectomy" is reported by Dubrueilh, of Montpellier. [22 Feb.] The transmaxillary method, by trephining the ascending ramus, as in Velpeau's method for the inferior dental, was adopted with success.

SURGICAL MYCOSES.

By ERNEST LAPLACE, M.D.,
PHILADELPHIA.

CARCINOMA ; TUMORS.

Etiology.—A very interesting research on the parasitic sporozoa in cancerous growths has been made by Sawtschenko, $\frac{50}{July\ 5}$ who fixes the tumor with Flemming's solution and stains it in the usual manner with safranin and picric acid, or with gentian-violet and eosin. Microscopic examination of the primary growth, and also of the metastases in the lymph-glands, reveals clear vacuolization of the protoplasm in the individual cancer-cells. The vacuoles have a globular form and are of different sizes, the smaller having a diameter of 4 to 5 μ, the larger completely filling the cancer-cell. In some vacuoles no contents, or, at most, only very fine granules, can be distinguished; in others protoplasmic masses (proportional to the size of the individual vacuoles) are observed. The form of these masses varies greatly, some being nearly round or oval, some quite irregular, reminding one of rhizopods. The majority have a typical form, though not one and the same, resembling frog-larvæ. The smaller appear quite homogeneous, but the larger forms show a central part, which the staining proves to be nuclear. The irregularity of form of these bodies is intelligible when we consider that they are living organisms, parasites. From this stand-point, it is to be inferred that the parasites have disappeared from the empty vacuoles already mentioned.

In certain large cancer-cells the protoplasm appears overfilled with rounded vacuoles, in each of which a high power reveals one or two "germs" of the peculiar frog-larva-like form. The number of such germs in one cancer-cell is over forty, and in different cells different stages of development are exhibited. A condition in which development was apparently still more advanced was seen in a certain number of cells, in the form of a

division of the "nucleus" of the parasite into two or more curved rods, considered to be analogous to sporophores.

The author compares his investigations with those of other observers, who had found more or less similar or dissimilar bodies in new growths, and concludes that the variety of parasitic sporozoa in the different kinds of cancer does not militate against a parasitic origin. If we grant the parasitic etiology, we must, *a priori*, expect that in the different types of cancerous growths there will be different kinds of protozoa, just as we have different kinds of bacteria in the different granulomata or specific new formations. Soudakewitch $\frac{262}{\text{Mar.}}$ observed bodies similar to those described by Wickham, Darier, Russel, and others, by placing them in 1-per-cent. osmic acid for two days, then in Müller's fluid for from three to five days, washing them thoroughly with water, hardening them with alcohol, and staining them with hæmatoxylin. He was able to make out within the cell, and even within the nucleus, small, unstained, rounded masses, some of which were surrounded by a homogeneous or finely granular or pectinate zone, or with pointed or blunted rays which were frequently colored by the hæmatoxylin. The more homogeneous these bodies are, the more perfectly they stain, whilst the striæ or granules around the homogeneous portion take a deep stain. There may be several capsules within the same cell, especially when the cells are of large size. Flemming's solution may be used instead of osmic acid, and Adamkiewicz's method of staining may be substituted for hæmatoxylin. Metchnikoff thinks that they are probably coccidia, and that earlier observers had undoubtedly demonstrated their presence, but that none of them had been able to obtain such definite results as Soudakewitch.

Nepoen $\frac{46}{\text{Jan.15}}$ concludes a very interesting monograph on the pathology of cancer, as follows: 1. The capillaries undergo a series of interesting changes: swelling, karyokinesis, and rupture of endothelium; epithelial infiltration of the walls of the small vessels, which become the centres of growth of new cells. 2. Local circulation is embarrassed, and there is congestion, stasis, and coagulation. 3. The blood presents changes in places, increase in number, and karyokinesis of leucocytes, destruction of red globules, diapedesis of white and red cells. 4. The lymphatics are filled with red cells, detritus granules, delicate epithelium, cells filled with fuchsin

bodies, and fuchsin bodies free and isolated. The lining epithelium is in places infiltrated with a large quantity of delicate granules staining with fuchsin, and their nuclei are multiplied. 5. In the connective tissue, numerous wandering cells with nuclei or nucleoli, separate from each other, all staining with fuchsin. 6. The fuchsin bodies have various origins: the proliferation and liberation of nuclei of leucocytes, the destruction of red cells (Klebs), the degeneration of lymphatic endothelium, or of fixed cells, or nucleolar proliferation of wandering cells.

In connection with the question of irritation, Teskey [39 June] calls special attention to the probable primary manifestation of the disease at some distance from the point irritated, as illustrated by the following cases: (1) scirrhus in axilla from irritation of the thumb-nail; (2) carcinoma of lymphatics of submaxillary region, from small abrasion in sublingual region. Age appears to be a predisposing cause, and that there may be other predisposing causes is rendered probable, in view of multiple epithelioma sometimes existing. Karg, [301 p. 402] after careful study of Paget's disease of the nipple, founded, however, upon only one case (with later recurrence), comes to the conclusion that the psorosperms described by Wickham and Darier are only the nuclei of peculiarly growing large epithelial cells, the protoplasm of the cell having become transparent and forming the clear zone which was said to develop the parasite. The two other forms of so-called parasites described by them are to be demonstrated in other carcinomata, although they could not be found in this case of Paget's disease. Karg concludes that they are the beginning cell-nests or pearls. Russel's fuchsin bodies Karg identifies with leucocyte collections and their remains. Clinically, Karg brings out two points of great interest. One is the difficulty of making a diagnosis from a small fragment removed before operation, owing to the varying structure of different parts of the tumor, and especially to the liability of error caused by the specimen including one of the epithelial cell-nests, which often form about tuberculosis or lupus, or even near an irritated, chronic ulcer of the leg. The other refers to the permanent cure of cancer, and he relates several cases where recurrence at distant points took place years after extirpation of the original tumor, the site of operation remaining healthy; for instance, in a case of resection of the pylorus, the patient enjoyed good health

for five years, when death took place from cancer of liver, the stomach being healthy; in a case of carcinoma of lower lip and a gland at angle of jaw, for twelve years healthy, recurrence took place in front of the ear. Schuchardt [226 p.255] analyzes the modern theories of the origin of epithelial growths, showing how Thiersch's theory, that they must spring from epithelial cells, still holds its own (modified to accommodate it to the newer views of embryonic development), in spite of the fact that some authorities are once more turning to the views of Virchow, and claiming that they can originate also from connective-tissue cells. In speaking of the early stages of epithelioma, he emphasizes the discovery made by him, that not merely the epithelium, but all the tissues of the skin, the connective tissue as well, show hypertrophic changes, and that, later, the overgrowth of epithelial cells outruns and overshadows that of the other tissues.

Contagion.—Many interesting articles have appeared during the year, tending to suggest the communicability and contagiousness of cancer. Many valuable reports of cases [212 Mar.] show (1) that the excessive frequency of cancer in country districts has a topographical cause, and, therefore, one foreign to the organism; (2) that water is the most common vehicle of the cancerous poison, as is proven by a number of reported cases in such localities as were deprived of clean water; (3) that the poison can be transmitted among the inhabitants of the same house, either directly or indirectly, through objects contaminated by the first patient. Guelliot [212 Mar.] reports that four persons, in no way related to one another, living in the same house, where they are much confined, die of cancer in less than five years. He attributes this to more than a coincidence. While willing to grant the predisposition due to heredity, he, at the same time, insists on the communicable nature of the disease, though to-day the cause is not proven. Fiessinger [55 Mar.5] likewise reports what he styles a cancerous epidemic. He tells of five cases where contagion is to be traced to cases pre-existing in the same house. Petit [188 July 24] reports a case which he styles generalized carcinomatosis or sarcomatosis, consisting of several tumors which made their appearance suddenly in the back, after but slight pain in that locality. Soon these growths appeared elsewhere, with a rapid breaking down of the general economy.

Treatment.—Burghard [26 Apr.1] concludes a most interesting paper

on the use of methyl-violet by injection in the treatment of inoperable malignant disease, as follows: 1. There is at present no reason to believe that methyl-violet is ever curative. 2. Within certain limits the effect produced varies directly in proportion to the amount employed. 3. Cases which are too far advanced for surgical interference are, therefore, too extensive to be brought thoroughly and permanently under the effect of the drug. 4. In the softer and more rapidly spreading growths, especially the small, round-celled sarcoma, it is practically useless. 5. In cases of the harder growths, which are only moderate in extent, it certainly seems to retard materially the rate of growth. 6. In all cases of ulcerated malignant growths, the combined injection and outward application of the drug is an excellent method of treatment. 7. In all cases where its employment does not cause pain, it is advisable to make use of it. Apart from the fact that it gives rise to no ill effects, the moral effect upon the patient is often most marked. He recognizes that something is being done, and is cheered accordingly. 8. If any effect at all is to be produced, large doses must be used.

Lavrand $^{220}_{\text{May }27}$ says that, at best, all that can be expected from the use of pyoktanin in the treatment of cancer is an improvement, not a cure. He uses it in deep injections.

Relating to the influence of the streptococcus of erysipelas on the retrogression of malignant tumors, Spronck $^{3}_{\text{July }27}$ says that he has isolated from this streptococcus the following substances: (1) a toxalbumen which is inactive when heated; (2) a toxin; (3) a predisposing substance which becomes inactive at 115° C. (239° F.); (4) a substance giving immunity, which is not impaired, even at very high temperatures; (5) proteids coming from the streptococcus itself, which dissolve themselves in the culture only at the death of the streptococcus. After speaking of the effect of the injection of these fluids into dogs, he says that, in man, a subcutaneous injection of the streptococcus of erysipelas produces, in about four or five hours, a moderate fever, accompanied by lassitude, cephalalgia, and nausea. In a few cases, there is redness and swelling and pain in the tumor; but if the injections are repeated, all these symptoms soon disappear. The therapeutic results are not very favorable; certain neoplasms have disappeared, but not all the tumors in the same individual; besides, their

diminution is not permanent. The tumors soon become accustomed to the injections of the erysipelas micro-organism, and resume their growth.

Marage, recognizing the great difficulty of absolutely establishing the diagnosis between syphilis and cancer, reports a case in which he resorted to the deep injection of bichloride of mercury 1 to 1000. After a time it was noticed that no change was taking place in the tumor, and hence a diagnosis of malignant growth was made. In a few days two salivary fistulæ were removed, followed by a disappearance of the tumor.

Schultz, of Budapest, $\frac{77}{July}$ reports ten cases of uterine cancer, in which the disease was arrested by injections of alcohol. The patient was placed in Sims's position and 5 cubic centimetres (80 minims) of alcohol injected. The needle of the syringe should be passed about an inch into the cancerous tissues. This causes some pain, which, however, does not last long. The injections are made daily and the vagina packed with iodoform gauze. About thirty such applications caused almost a total disappearance of the growth, and epithelium developed over the eroded surface. How long this condition will last, observes Schultz, the future will show. Carpenter $\frac{787}{July}$ describes a remarkable cure of a recurring sarcoma of the breast by the use of poke-weed (*Phytolacca decandra*) and yellow dock (*Rumex crispus*), each being employed in the following proportions: 1 fluidounce (30 grammes) of the extract of yellow dock was added to 9 fluidounces (270 grammes) of water; then 1 drachm (3.75 grammes of the fluid extract of poke-weed was added to 20 drachms (75 grammes) of water, and of this second mixture the patient added a quarter of a teaspoonful to the mixture containing the yellow dock, the dose of which was 2 tablespoonfuls three times a day. In addition to the internal treatment, a salve was prepared from the fluid extracts, applications of which were made night and morning to the growth. The strength of the formula is as follows:—

℞ Ext. poke-weed, fl., . . . 1 drachm (3.75 grammes).
Ext. yellow-dock, fl., . . . 2 ounces (60.00 grammes).
Ceræ flavæ, ... 1 ounce (30.00 grammes).
Adipis benzoat., ... 3 ounces (90.00 grammes).
M. et ft. unguentum.

In cases of cancerous affections of the cutaneous surface, the

poke-weed must be omitted from the ointment. The tolerance of the poke-weed is stated to be very different in different patients, but the incipient dose should not exceed two drops of the fluid extract, even that dose producing most unpleasant symptoms in susceptible persons. Coffee is said to be the best antidote, in case the toxic effects of the drug are manifested, and one of the injunctions laid upon a person undertaking the treatment is strict abstinence from that beverage during its continuance.

In an excellent article on the treatment of cutaneous malignant epitheliomata, Robinson [101 July] advocates the use of arsenious acid, above all other remedies, for the destruction of epithelioma, especially where it is desirable to save as much tissue as possible, and concludes that by judicious cauterization with chloride of zinc and potash a great many cases of what would be deemed incurable cases can be brought tó a permanent healing. Watson Cheyne, [6 Aug. 13] speaking of the surgical treatment of cancer of the breast, says: "In all cases there should be free removal of the skin, especially over the seat of the tumor; complete removal of the breast, bearing in mind its great extent; removal of the pectoral fascia co-extensive with the breast and right on to the sternum, along with a thin layer of the muscle behind the tumor and the main part of the breast; removal of the fascia over the serratus magnus in the axillary region, and of all glands and fat from the axilla, not by pulling out the glands, but by clean dissection; further, if the tumor is adherent to the pectoral muscle, removal of large strips of that muscle. This may seem a very extensive operation, but the object is to rid the patient of her disease, and that can only be done by removing all the probable seats of recurrence." Adamkiewicz, [6 Feb. 13] who has been experimenting in Vienna with his so-called Cancroïn, presented a case of alleged cure of cancer of the neck to the society of medical men there; but Billroth, Albert, and Kundrat controvert the statement that anything out of the ordinary course of the disease had taken place as a result of the treatment of Adamkiewicz.

Recurrence.—Dennis, [59 Feb. 27] in reviewing the conditions that favor a return of the carcinoma of the breast, says that 25 per cent. of the cases operated upon fail to recur. The recurrence is influenced by the following conditions: 1. The period of time from the appearance of the growth to the time of operation, the average

being six months, since at this time little or no infection of the neighboring lymphatic glands has taken place. 2. The extent to which infiltration has taken place. 3. The radical character of the operation, extensive operation being suggested from the fact that Küster has examined the glands removed from 117 cases of cancer of the breast, and only two cases failed to show no invasion. 4. The histological character of the carcinoma itself. Tumors showing structures departing slightly from the normal are favorable cases, and, the more embryonic the structure, the greater the liability to recurrence. 5. The simultaneous appearance of carcinoma in both breasts. This condition, however, exists only in 5 per cent. of the cases. 6. The personal factors of the individual, such as age, sex, marriage, traumatism, race, etc. The locality of the carcinoma has a marked influence upon its recurrence after removal. More white persons die from carcinoma than negroes.

ACTINOMYCOSIS.

A. Raffer [589 Feb.4] has, since 1887, observed four cases of actinomycosis in the human subject, all of which were cured. The first, a case of abdominal actinomycosis, was treated by scraping. The others, occurring during 1890–91, were examples respectively of actinomycosis of the jaw, parotid, neck, and occiput. From his experience, Raffer puts forward the following conclusions as to the nature and treatment of the disease: 1. Actinomycosis is due to a special parasite, which does not always cause suppuration, but promotes the formation of a special granulation tissue, which easily breaks down. 2. Infection is generally produced by the penetration of vegetable substances, and is spread through the connective-tissue spaces, avoiding the lymphatics. 3. Transmission from animal to animal and from animal to man has not been demonstrated. 4. The avenues of entry are the skin, respiratory passages, digestive tract, and most usually the mouth. 5. The treatment recommended when the infiltration is diffuse, without evident capsule, is the injection of antiseptics with an ordinary hypodermatic syringe, in various parts of the swelling, using at each sitting 1 to 3 grammes (15½ to 46 minims) of a 5-per-cent. solution of carbolic acid in glycerin. The injection may be repeated in from two to five days. If there be sinuses, pledgets of cotton-wool, soaked in the antiseptic, should be introduced into them. 6. Although carbolic acid

was chiefly relied on, the author, on one occasion, used a 1-per-cent. solution of methyl-violet as well, apparently with good effect. 7. While giving prominence to this purely antiseptic treatment, he suggests the advisability of combining with it, in some cases, the use of the knife or cutting spoon. Köttnitz [69 No.48] recommends, in actinomycosis of the skin and soft parts, the employment of the nitrate of silver in substance. He has successfully used this remedy in four such cases of actinomycosis of the head and neck with suppurating and long-lasting fistulæ. In one case recovery has lasted for three years; in the other three, a year to a year and a half. All presented carious teeth on the affected side.

Murphy [779 Dec.,'91] says that the vast majority of cases not accessible to surgical eradication terminate fatally, the exception being rare cases where the disease seems to die of inanition. He reaches the following conclusions: 1. The growth of the disease is very indolent and sluggish, except in the peritoneal cavity. 2. It is accompanied by very little pain. 3. The microbe does not produce a ptomaine that has the effect of causing a rise of temperature. 4. Pure infection by the actino-cladothrix is not accompanied by pus; pus is only present after secondary infection by the streptococcus pyogenes. 5. The amount of infiltration around each nodule of granulation and its sero-purulent contents is very great compared with small contents. 6. The greater the amount of suppuration, the more malignant and rapid the progress of the disease. 7. Diffusion of the actinomyces *in loco* and by entrance into the blood-stream are the modes of extension, never the lymphatics and glands. Its extension is greater in the direction opposite to that of the course of the lymphatics. 8. After evacuation of the contents the nodule heals rapidly, but in a few weeks reappears if all the germs have not been removed. 9. Fatal symptoms are tardy in appearing, principally on account of the very great connective-tissue infiltration, which bars the progress of the disease. The illustrations on pages 10, 11, and 12, reproduced by Murphy from James Israël's article, [20 v.74] show the different microscopic appearances of the fungus in various stages.

TUBERCULOSIS AND SCROFULOSIS.

An article on the relation of these two conditions to each other gives the following interesting conclusions [1038 Jan.29]: 1. The

anatomical lesions of scrofulosis and tuberculosis are identical. 2. Koch's bacillus is found very irregularly in strumous as well as in tuberculous products. 3. It is certain that pus which produces

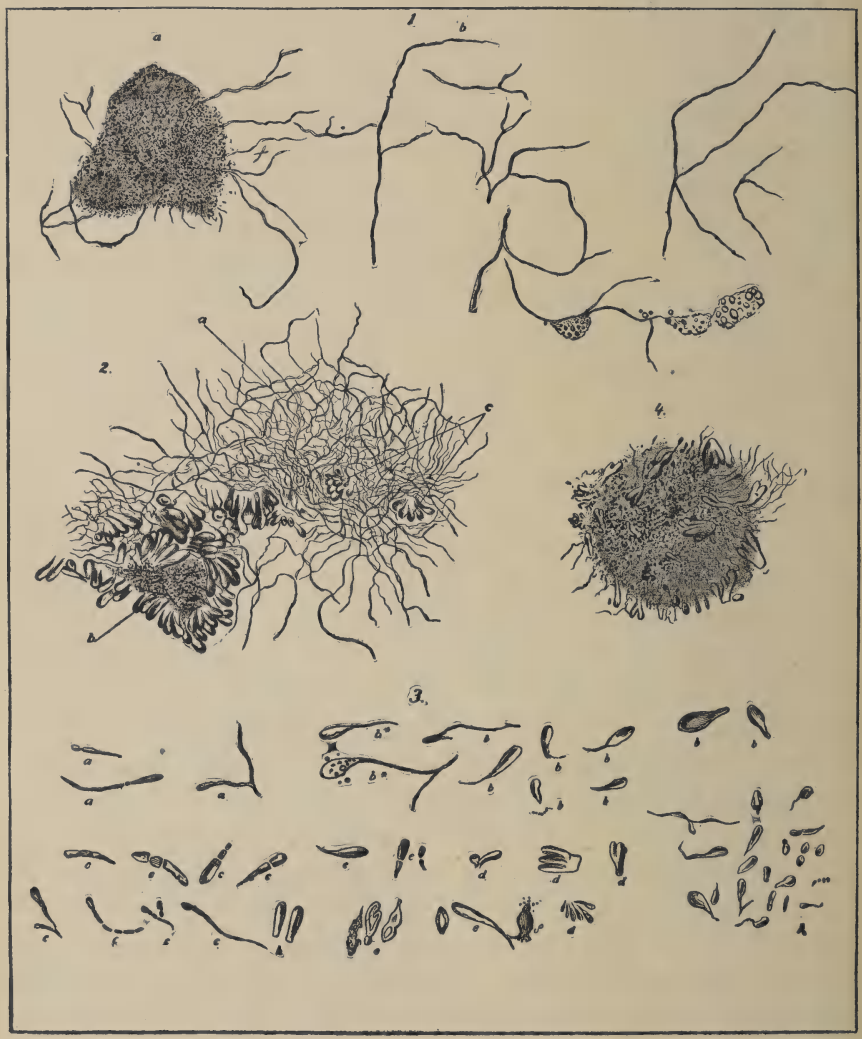


FIG. 1.—ACTINOMYCOSIS HOMINIS.

1, *a*, small piece of a small nodule from subcutaneous abscess, x 750; *b*, isolated threads. 2, fragment of a nodule from lung (threads and bodies). 3, from nodule in lung. 4, sprouting conidia from lung, x 330.

(*Virchow's Archiv.*)

tuberculosis must be tuberculous, if this tuberculosis can be transmitted through several generations. 4. Various conditions are now included under the head of scrofulosis; hence it is all-important

to determine the tuberculous nature of certain cases. 5. There may be localized tuberculosis in non-tuberculous patients; hence the propriety of operating rapidly, before the system has acquired

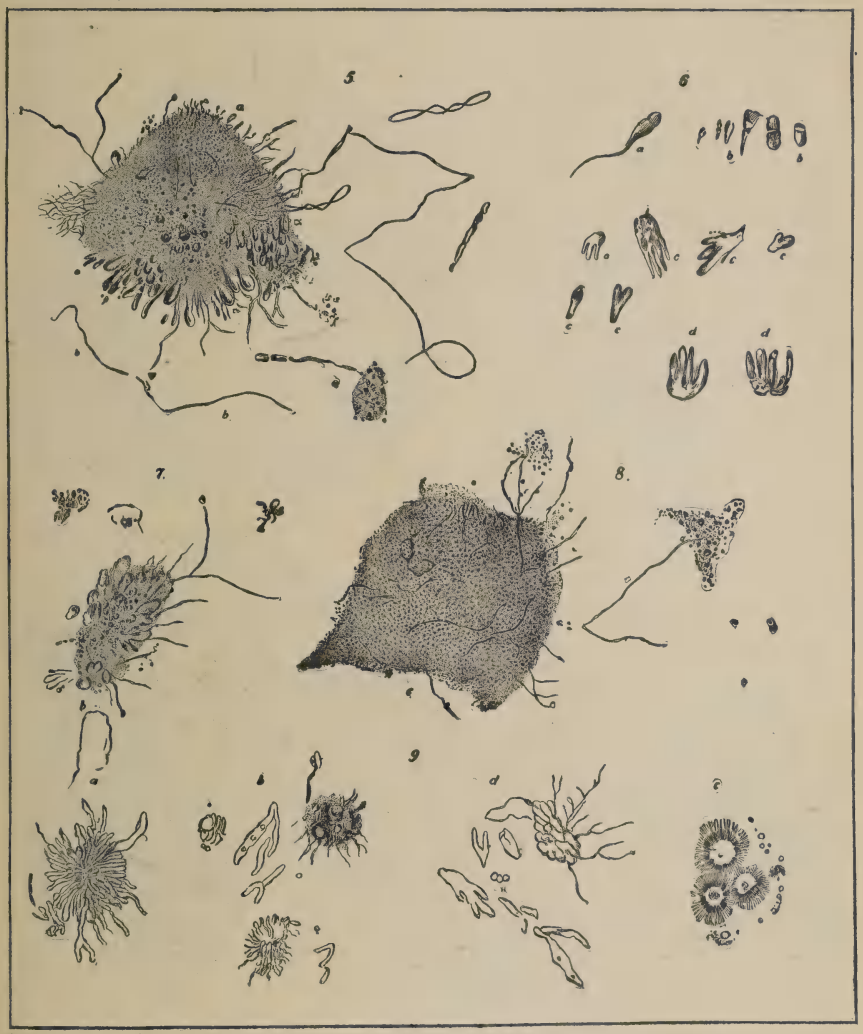


FIG. 2.—ACTINOMYCOSIS HOMINIS.

5, small fragment from abscess in neck, showing mycelium with club-shaped termini and fatty degeneration of centre. 6, division and sprouting of fungus from abscess in neck, showing cocci and their elongation into rods and threads and branching of the latter. 7, disintegration of glistening body through fatty degeneration (cervical abscess), x 1100. 8, mycelium threads in fatty *débris*, x 1100. 9, from gravitation abscess and carious vertebræ; *a*, sulphur-colored granule, x 1100, oil immersion; *b* and *d*, fragments of degenerated granule, x 1100; *c*, granule compressed, x 300.

(*Virchow's Archiv.*)

the tuberculous taint. 6. There is at present but one test of true tuberculosis, and that is inoculation.

Speaking of operative treatment in surgical tuberculous cases, Watson Cheyne $_{\text{June 26}}^{6}$ considers it desirable in the following cases: Where chronic suppuration has recurred; at an early stage, where

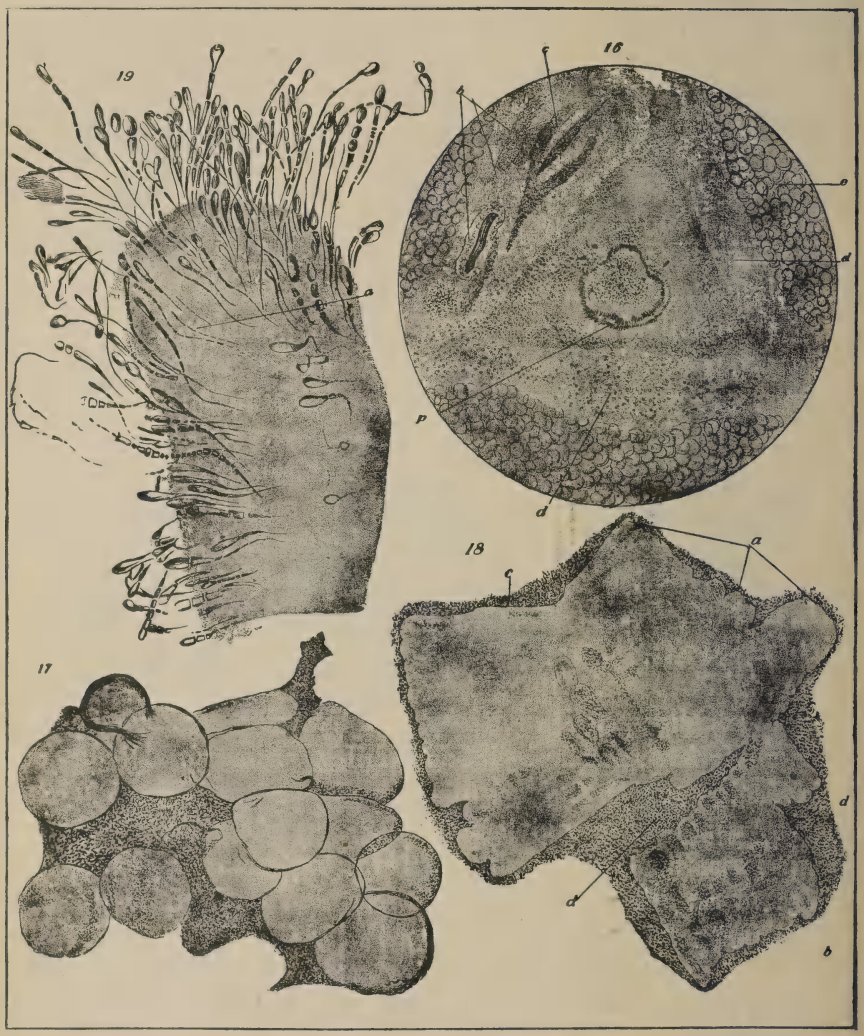


FIG. 3.—ACTINOMYCOSIS HOMINIS.
16, embolism in branch of portal vein. 17, 18, 19, different forms of fungus from submaxillary abscess.
(*Virchow's Archiv.*)

the disease is localized to one part of the synovial membrane or bone; in many cases, at a later stage, where there is a deposit in the bone along with general synovial thickening; in cases of diffuse synovial thickening, where the expectant treatment has failed

to arrest the progress of the disease; in cases where a better functional result can be obtained by operation; in cases of adults, where deformities are present which can only be remedied by operation; in many cases where there are septic sinuses; in certain cases where phthisis is present, or where the general condition is such as to require the removal of the disease; in adults more frequently than in children; in the poor more often than in the rich.

Expectant treatment should be employed in the first instance in cases of diffuse synovial disease without suppuration, provided there are no reasons requiring immediate operative interference, and it should be persevered in for a considerable time, and in some cases where septic sinuses are present. Much also depends on the joint which is the seat of disease; for example, in the case of the hip-joint, expectant treatment should be much longer persevered in than in a more superficial and easily accessible part.

Calot $_{\text{May 7}}^{3}$ has successfully treated the unsightly scars sometimes existing as the result of suppurating glands, by removing with the scalpel the totality of the impaired skin, which measured four centimetres in length by three centimetres in width, encroaching upon the healthy integument to the extent of one or two centimetres.

The lips of the wound were freed, and with very fine needles the edges were approximated, without drainage. This has met with the greatest success also in ulcerating scrofulides of the neck. Particular stress is laid upon the necessity of the absence of drainage.

Reimer $_{\text{B.34,p.357}}^{301}$ gives the history of a child suffering from tuberculosis of both knees and double keratitis, which he cured by injections of tuberculin. The author considered it an undoubted case of tuberculosis. Injections of $\frac{1}{2}$ milligramme ($\frac{1}{130}$ grain) were given to commence with and increased to 2 milligrammes ($\frac{1}{32}$ grain). The corneal and knee troubles disappeared. Good results were also obtained in the treatment of two cases of Pott's disease and one of lupus.

Landerer $_{\text{No.11}}^{113}$ has employed cinnamic acid in 45 cases of surgical tuberculosis, of which 31 were cured, 7 were improved, 1 was unrelieved, 2 died, and 4 were still under treatment at the time of the report. In cases of tubercular arthritis an

emulsion of cinnamic acid was injected into the joints, the following formula being employed:—

℞	Acid. cinnamic.,	5.00
	Ol. amygdal.,	10.00
	Vitelli ovi,	unius.
	Sol. sodii chlor. (0.7 per cent.), q. s. ut fiat emulsio,	100.00

The cinnamic acid is first rubbed fine with the oil, then the fresh yelk of one egg is added; after these have been mixed together, the salt solution is added in drops. The resulting emulsion has a strong acid reaction, which, before it is used, must be neutralized by the addition of a 25-per-cent. solution of potassium hydrate. About 5 cubic centimetres (80 minims) is deeply injected and the injection repeated twice a week. In cases of fistulous processes a solution of cinnamic acid (1 to 20) was injected into the surrounding tissues. If this was insufficient the foci were laid bare, curetted, and tamponed with balsam-of-Peru gauze, or cauterized with cinnamic acid in alcohol. Frequent irrigation of wound-cavities with the latter or with Peru balsam was also found of value.

Max Schüller [301 B.33,H.2,3] strongly advocates the use of guaiacol in tubercular affections. It is given internally, prepared as follows:—

℞	Guaiacol.,		5
	Spts. vini rect.,		
	Aq. menth. pip.,	āā	150
	Olei papav., vel ol. jecor. aselli,		50

It is to be well shaken, and a tablespoonful given four or five times daily. For the past year the author has been giving the pure guaiacol in 2- to 5-drop doses in 100 to 150 grammes ($3\frac{3}{8}$ to 5 ounces) of sugar-water. There is also a new preparation—guaiacol carbonate—which may be used. The drug should be given continuously for at least eight weeks, and is well borne, even for months. In 90 cases of surgical tuberculosis, 70 were healed, 16 improved, and 4 died. Locally, surgical treatment is advised, to be used in conjunction with the internal administration of the guaiacol; thus, in joint diseases the injection of iodoform is to be practiced, and in glandular affections extirpation and curetting. The favorable results of the remedy he ascribes to its action on the cells in the neighborhood of the tubercular focus.

Referring to the creasote treatment of tuberculosis, Sommerbrodt [4 No.26] calls attention to the necessity of using large and long-

continued doses, in order to obtain the proper results,—viz., for adults, 1 to 4 drops daily; children, $\frac{1}{2}$ to $1\frac{1}{2}$ drops. The treatment should also be used in scrofulous conditions.

Moncorvo [296 Aug.8] reports the results of treating a case by Lannelongue's sclerogenic method. The patient was a girl, who showed many signs of congenital syphilis and had also passed through attacks of malaria. She actually came, however, for treatment of a large glandular mass situated beneath the inferior maxilla. There were also signs of incipient phthisis at both apices. The author made injections of 3 or 4 drops of a 1-to-40 solution of chloride of zinc in the neighborhood of the tumor. This was repeated on three occasions, but as it caused some pain it was discontinued for awhile. After five days, treatment was resumed, and, a few days later, the strength of the solution was increased to one in twenty. Two injections of this strength were made at intervals of a fortnight, after which active treatment was discontinued. The gland underwent a shrinking process, and, after three months, nothing was left of the tumor but three very small remnants of gland, which were only just perceptible to the touch and quite painless. At the same time, there was a marked improvement in the child's nutrition and general condition.

Lannelongue [321 May 1] summarizes the results he himself has obtained by the sclerogenic method. He emphasizes the safety of injecting as much as 40 drops of a 10-per-cent. solution of chloride of zinc around the synovial fungosities of the knee of a child 8 to 12 years old, increasing the dose for adults. When one injection does not suffice, a second is tried in about three weeks. Immobilization and compression of the joint are essential adjuncts to the treatment. These are kept up until the sclerosis is really established and the limb can be left to itself, and movements of the joints may be commenced. This period may be put roughly as the middle of the second month of treatment. In children anæsthesia is necessary; in adults it may be omitted, a hypodermatic injection of morphine taking its place. The results are a flattering indication of the value of the method. Coudray, of Paris, [3 May 7] has used Lannelongue's method in 90 cases of surgical tuberculosis, 31 of large joints; 4 cases of Pott's disease; 6 cases of osteitis of the foot and hand; and 9 cases of tubercular adenitis. In every case the result has been satisfactory.

Weidenmuller [13 Oct.,'81] advocates the treatment of surgical tuberculosis with iodoform injections. He uses the 10-per-cent. iodoform-glycerin emulsion. Out of 22 patients, 7 were healed, 11 much improved. In one case only was there no improvement.

A. Arens [761 B.8,No.2,'91] gives an account of the results of the use of iodoform emulsion in Trendelenburg's clinic at Bonn, with reports of sixty cases of white swelling, tuberculous osteitis, etc., treated by that method. He uses an emulsion of iodoform, 20 per cent., in sterilized olive-oil. The injections are made with a Pravaz syringe of the capacity of 4 cubic centimetres (60 minims). In cases of abscess the purulent collection is first punctured, then evacuated. If the skin is thin and red at any point, the injection should be made in some other part of the swelling, so as to lessen the risk of leaving a sinus. In fungating joints the needle is plunged boldly through the mass of fungosities, into the centre of the articulation. The amount injected at one sitting is not large, but the operation is repeated at relatively short intervals. As a rule, about 4 grammes (60 minims) of the emulsion are injected once every four days. In cases of large congestive abscesses, 15 grammes (4 drachms) are injected once a month. No acute or toxic effects have ever been observed in Trendelenburg's clinic; in only one case of tuberculous knee, which had long been treated by injections of iodoform, there supervened symptoms of melancholia, which ceased after resection of the joint. Summing up the effect of the treatment, Arens says that it is harmless; in the majority of cases it brings about an improvement, evidenced by diminution of pain and restoration of function; the results are, as might be expected, most favorable when the disease is in the first stage. The co-existence of pulmonary tubercles does not make the prognosis less favorable in cases of tuberculous joint. To prevent relapses, the injections should be continued at long intervals, even when cure appears to be complete.

Artificial Abscess.—Fochier, of Lyons, [152 May 20] has observed that in a number of puerperal cases improvement took place as soon as the signs of a localized suppuration—*e.g.*, in the mamma—had set in, while other cases characterized by the formation of abscess went on to a fatal issue. Fochier was therefore induced, in some desperate cases, to try the expedient of bringing about artificially the formation of abscesses. This he effected by the subcutaneous

injection of small quantities of essence of turpentine into one or more of the patient's limbs. The results were highly satisfactory. In a former communication [152 Apr.29] he came to the conclusion that pyæmia, septicæmia, erysipelas, osteomyelitis, and indeed all acute diseases in which suppuration may occur, would be benefited by this treatment. A relation seems to exist between the acuteness of the phlegmon and the improvement in the general symptoms. The two points of election are the insertion of the deltoid and the hypogastrium; the pain is not so great there as elsewhere. The injection is very painful. The phlegmon may assume one of two forms: (*a*) the anthracoid variety, in which acne-like pustules are seen to form under the epidermis and to communicate with the subcutaneous collection by numerous apertures, which give exit to a badly-formed pus mixed with the *débris* of sloughing tissues; (*b*) the residual variety, in which, after a longer or shorter acute stage, generally with unmistakable fluctuation, the abscess takes on a doughy consistence while still slowly developing, but without any tendency to spontaneous opening. Two injections at a time are sufficient, and there is no harm in opening if convalescence should not be thoroughly established. But four punctures may be made at one time, as Lépine and Dieulafoy have done; or every second day, as Thiéry, of Rouen, has done. In cases of severe general infection, especially if there be no considerable local lesion, it may be necessary again to have resort, after an interval, to an artificial production of abscesses. In generalized infections with important local lesions, it is not advisable to wait until such lesions show a tendency to suppuration. Certain subacute and chronic abscesses in surgical affections are, perhaps, amenable to this treatment.

Serous Abscesses. — Nicaise [91 Aug.10] says that these abscesses are accompanied by four principal phenomena: there is (1) an exudate which spreads itself between the elements of the inflamed portion; (2) an accumulation of new cells; (3) a breaking-down and softening of the connective-tissue cells; (4) formation of new blood-vessels. The predominance of the exudate forms a special variety of inflammation, which manifests itself in the pleura and serous sacs; it is also possible in cellular tissue, where it forms collections which deserve the name of serous abscesses. This may be acute or chronic. It forms in the subcutaneous cellular tissue, in the intermuscular tissue, and under the periosteum.

Helferich, of Greifswald [4 No.4] treats severe abscesses by making a large incision, under an anæsthetic, and laying open every possible spot of infection, so that he can see exactly the relations with the healthy tissue, the special object being the complete removal of all that may possibly be offensive, so that the process is immediately stopped and the patient is free from fever in a few days. Thorough washing with a 6-per-cent. sodium chloride solution and packing with iodoform gauze are followed by gentle compression. Under this treatment tissue-building is very rapid.

Hydatid Cysts.—Bouilly [290 No.21] says that those cysts containing numerous daughter-cysts, those which are multiple and disseminated in the same organ, and those which are suppurating, should be treated by incision. Simple unilocular cysts containing characteristic clear liquid are most successfully managed by the injection of sublimate solutions. The author has treated ten cases of hydatid cysts by means of these injections, and has been successful in eight cases. Twice the effusion was reproduced. In one instance this was due to faulty technique. The method of procedure is to empty the cyst of all its contents by aspiration. This having been accomplished, 1½ drachms (5.55 grammes) of Van Swieten's solution or of a sublimate solution (1 to 1000) are injected into the cavity and allowed to remain. The puncture wound is closed by means of iodoform and collodion. The temperature generally rises the evening of the operation, returning to normal the next day. Cure is rapid and complete. The last case the author operated on was suffering from great pain, vomiting, dyspnœa, and marked fever. Three drachms (11.10 grammes) of Van Swieten's solution were injected, the patient being entirely cured. Several of the patients have been under observation for some years, and in all the cure has been permanent.

GLANDERS.

Nocard, of Alfort, [109 Sept.] has obtained from cultures of the bacillus mallei a liquid which, when concentrated and filtered, closely resembles tuberculin in character, and has apparently a specific action on the lesions of glanders. Colning and Hellmann had already found that, when extracts of cultures of the bacillus mallei were injected into horses suffering from glanders, an acute febrile reaction was set up, but that healthy horses were generally

unaffected by such injections. Nocard's method of experiment is as follows: By successive passage through animals the virulence of the bacillus is first increased so that it will kill a rabbit or white mouse—both usually resistant—in less than thirty hours. This highly-virulent bacillus is then grown in a peptone-glycerin broth for a month, at a temperature of 35° C. (95° F.). The culture is next sterilized at 110° C. (230° F.), filtered, and concentrated *in vacuo* to one-tenth of its original bulk. The result is "mallein," which contains about 50 per cent. of glycerin. Before injection it is diluted with ten times its volume of 5-per-cent. solution of carbolic acid. A large dose, 0.5 to 1 cubic centimetre (8 to 16 minims) of the original liquid, diluted as above and injected into a healthy horse, produces some local swelling, accompanied by an intense febrile reaction, beginning about eight hours after the injection and lasting for from twelve to fifteen hours. If 0.25 cubic centimetre (4 minims) be injected, there is no reaction, either local or general. On the other hand, if this dose be injected into a horse affected with glanders, an intense reaction is produced; an immense swelling appears at the seat of injection, the animal becomes extremely ill, its respiration quickens, it shivers in every limb, and its temperature rises rapidly two or three degrees. The maximum is reached about the tenth hour, but the temperature remains high for from one to two days. Nocard has tried the effects of mallein on 48 suspected horses; of these, 34 gave the violent reaction above described, and were undoubtedly affected with glanders. Of the remaining 14, 8 showed no reaction, and afterward proved to be healthy; the other 6 had a rise of temperature of from 1° to 1.8° C. (1.8° to 3.24° F.), and, although not affected with glanders, were found to have either enlarged lymphatic glands or chronic pulmonary lesions, which may have accounted for the incomplete reaction. Nocard concludes that: If the injection produces a rise of temperature equal to, or exceeding, 2° C. (3.6° F.), the animal is certainly affected with glanders. If the temperature either does not rise at all or rises less than 1° C. (1.8° F.), the animal is not glandered. If the temperature rises between 1° and 2° C. (1.8° and 3.6° F.), the animal, though not certainly glandered, should be regarded as a suspect. Claudius and Michel, $\frac{3}{\text{Aug. 24}}$ owing to the certain amount of analogy between glanders and tuberculosis, have used the creasote

treatment, as well as Lannelongue's chloride of zinc, in glanders. The results have been found most satisfactory, as was shown at the autopsy of several horses, which, having thus been treated, were sacrificed to see the effect of the treatment. Sabourand, [3 Apr.21] in the course of researches made upon a patient affected with glanders of the face, conveyed the disease to guinea-pigs by inoculation into the peritoneal cavity. Specific orchitis ensued in three days. Pure cultures were obtained from the vaginitis, producing the characteristic brown color upon potatoes.

CARBUNCLE.

Spehn [67 Mar.25] recommends very highly the use of chloral for the treatment of boils. He directs that the boil or carbuncle be kept covered continually with a tampon of cotton-wool soaked in the following solution:—

℞ Chloral. hydratis, ... ʒiiss (10 grammes).
Aquæ,
Glycerini, ... āā fʒv (20 grammes).—M.

The treatment is said to be superior to all others. Polaillon [24 Jan.] calls attention to the fact that the spray of carbolic acid does not always cure furuncles or carbuncles. In the first stage this treatment does well, but not after suppuration has set in and sloughs exist. He prefers the actual cautery, by which the slough is soon removed; or, in other cases, the use of caustics, preferably chloride of zinc. When the slough has been eliminated, he uses antiseptic poultices.

ANTHRAX.

Pathology.—Petermann [262 Jan.] has re-investigated the immunity produced by the anthrax albumose, which was first announced by Hankin. The same results were obtained, as far as the preparation of the albumose is concerned. Hankin, by means of his albumose, produced immunity against virulent anthrax, both in rabbits and mice. With larger doses he produced a disease resembling anthrax in its course, and ending fatally. Petermann, experimenting on rabbits, guinea-pigs, and mice with very small doses, failed to produce any reaction except a rise of temperature amounting to 1° or 2° C. (1.8° to 3.6° F.). Further than this, inoculation with anthrax of various virulence, made ten to eighteen days after the injection of the albumose, in all cases produced death gener-

ally before that of the controls. Petermann then attempted to produce a protective albumose by varying the culture-fluid, using, instead of the 0.1 per cent. Liebig's extract broth with fibrin, filtered infusions of beef, liver, thyroid gland, kidneys, or testicles. From cultivations in these media he succeeded in extracting small quantities of albumose, but it had no protective action against anthrax. The only positive fact made out was, that cultures on ox-serum, filtered through porcelain, have a protective action when injected in large quantities into the veins; but the immunity thus conferred is only temporary, and lasts but one or two months.

Wiggin $_{\text{Nov.28,'91}}^{1}$ reports a case of general infection from anthrax in a man 33 years of age. There was great hyperæmia; symptoms of intestinal perforations developed, and he died on the fifth day. There was considerable ulceration of the throat. The autopsy showed perforation, resulting in general peritonitis. On examining the intestines, much pus was found about the perforation; the liver, spleen, kidneys, stomach, and lungs were much congested; there was pulmonary œdema. It was found that the patient had butchered some animals about a week previously; that he had held the knife in his mouth while skinning the animals, which might account for the primary infection of the throat. The case was pronounced, after bacteriological examination, to be anthrax, or mycosis intestinalis.

Two cases are also reported by Lowe, $_{\text{Jan.23}}^{6}$ in both of which the pustules were on accessible parts; that is, the neck and cheek. In both the disease was liberally removed with the knife, and was followed by rapid convalescence. Both cases suggest that when anthrax attacks the skin it may remain local for a considerable time, and produce a mild affection as compared with the same disease when attacking the internal organs. From these cases the fact is well established that theoretical considerations should never deter one from operating, not only during the early stages, but at whatever period of the disease the cases present themselves. In fact, there are a number of instances where success has followed excision, even in the later stages. It seems that we have, in the pustule, a manufactory which supplies bacilli in unlimited quantities, and that when this is removed the microphages are well able to cope successfully with any organisms which may have escaped into the blood-stream.

A case was brought to Bellevue Hospital $\frac{99}{\text{Aug.11}}$ suffering from gangrenous cellulitis of the cheek, which, the patient stated, resulted from the bite of a mosquito three or four days previously. Despite the most energetic treatment, his condition rapidly grew worse, resulting in meningitis. Death was caused by anthrax, probably brought into his system by the mosquito's bite.

Villeneuve $\frac{46}{\text{Aug.1}}$ treated a malignant pustule of twenty-four hours' standing by cauterization with the thermo-cautery. The edges were also cauterized and injections of tincture of iodine were made, the case resulting in cure. Grabowski $\frac{673}{\text{Mar.}}$ details ten consecutive cases of anthrax (four very severe) cured by hypodermatic injections of carbolic acid. A 5-per-cent. solution of the acid is used, 1 to 3 Pravaz syringefuls being injected at a time, once daily. Wine in small quantities was given internally, without other medication. There were three to eight injections made in each case. In a week the slough became detached, leaving a healthy, granulating surface.

SURGICAL DISEASES.

By LOUIS McLANE TIFFANY, A.M., M.D.,

AND

RIDGELY B. WARFIELD, M.D.,

BALTIMORE.

HYDROPHOBIA.

The medical world of to-day does not more closely associate the name of Jenner with vaccination against small-pox than it does that of Pasteur with whatever is known of that most formidable of diseases,—hydrophobia. After years of controversy, the value of vaccination is generally accepted and the measure stands as, perhaps, the most brilliant and beneficial of medical discoveries. Equally brilliant, although less definitely established, are the doctrines of Pasteur concerning hydrophobia, and the most suggestive lesson of the year, to be gathered from a review of the literature, is that the customary expressions of doubt and denial of the efficacy of the antirabic inoculations have become less frequent and less emphatic, while on the other hand evidence of their value grows constantly stronger and more convincing. Since July 4, 1885, when at Pasteur's hands Joseph Meister was first subjected to a series of inoculations with the now widely-known spinal-cord emulsion, the eyes of the scientific world have been directed to Pasteur and his method. To the great savant himself, and to his followers working along identical lines, may be ascribed all the advance which is to be noted in our knowledge of the disease. Indeed, the bulk of all recent literature on the subject has been made up of the history of cases submitted to the Pasteurian treatment, of descriptions of this treatment, and of comments, favorable or unfavorable, as to its real worth. Besides this, for the past year we have to record for this disease some really new and interesting observations made from different stand-points by various investigators. Hydrophobia, once initiated, has been uniformly regarded as a disease unerringly and quickly fatal. Pasteur himself so con-

siders it, and he has never suggested his treatment in the human subject except as a preventive measure only certain when the effects of the bite are forestalled. Various deaths from the disease have occurred during or just after the course of inoculations, and these cases have been cited as coming too late for treatment. In 1891 Chantemesse's researches made it probable that the disease, under some circumstances, might be cured; and during the past year there comes to us from a most capable authority the startling announcement of the actual cure of a case of unmistakable hydrophobia, effected through the employment of a bold modification of the same Pasteurian method. This case, which deserves description, was observed and treated by Auguste Murri, Director of the Pasteur Institute and Professor of Clinical Medicine in the University of Bologna. [14] May 22

The patient, a man of 22 years, was bitten in the calf of the left leg by a rabid dog on March 3, 1892, and came under treatment four days later in the Bologna Institute. Forty-nine inoculations (1.5 cubic centimetres—25 minims) were given during a period of twenty days.

"During the first four days the emulsions contained, respectively, medullæ of the fourteenth, thirteenth, twelfth, eleventh, tenth, ninth, eighth, down to the seventh day. On the sixth day medullæ aged six and five days were injected, and from the fifth to the twentieth day the ordinary series of medullæ were employed, *i.e.*, those of six, five, four, and three days, repeated down to the end of the treatment."

Through this treatment the patient passed without any trouble of any kind; but just at its end, on the night of March 26th, ugly symptoms developed. Intense pain was experienced along the spinal column, throughout the lumbar and dorsal regions; a sensation of heat pervaded the body, sleep was impossible, and in the morning a distinct loss of power was observed in the lower extremities. These symptoms deepened, and in addition, on the 28th, vomiting and fever set in. By the 29th the paralysis of both legs was complete, together with the retention of both urine and fæces. The presence of paralytic rabies was now considered unmistakable, notwithstanding that the subcutaneous injections had been pushed in increased doses. Murri, seeing that, in this case, the ordinary means of inoculation proved manifestly too

slow, determined now to try intra-venous instead of hypodermatic injections. The observations of two different men tended to justify this procedure. In the first place, Novi had noticed that the absorption of the emulsion from under the skin took place very slowly, leaving induration and swelling about the point of injection for a considerable time. Furthermore, some experiments of Poppi had shown that, in rabbits, intra-venous injections of the emulsion could be practiced with impunity, provided the preparation was fresh and freed from solid particles.

For these reasons, and taking into account the failure of the ordinary treatment, and the fact that the patient was practically condemned to death, intra-venous inoculations were begun on the 29th, with an emulsion carefully prepared from cord of six, five, four, and three days. At first two injections daily were given, afterward only one; and by April 17th, the patient having constantly improved from April 1st, the disease was completely conquered. The convalescence in this case was protracted, but constant; the reflexes, which had been lost, returned, and the paralysis gradually gave way to a restored muscular activity. Murri concludes that the history of the case demonstrates that Pasteur's method is not only of value in preventing hydrophobia, but that it may be so modified as to be an efficient remedy against the developed disease. He states that the dog inflicting the bite in the above case was certainly rabid, although no experimental proof was obtainable, the animal having been destroyed. He answers, also, the possible objection that the man may not have had genuine hydrophobia by stating that, besides the most suggestive general symptoms and entire absence of hysteria, there was in this case a definite acute myelitis of the lower cord. Such a myelitis one would expect to find in hydrophobia, and in no other condition; and Murri considers that it would be altogether illogical to seek for an unknown cause in the presence of one so well known.

Again, granting that the disease was genuine, it might be urged that the attack had resulted from the inoculations, rather than from the bite. According to Murri, this objection loses all force when we consider the extreme rarity of such symptoms during or after inoculation, and especially since it has been proven that the virus of the emulsion acts like that from animals suffering from "street rabies," and not like the intensified "laboratory

virus." The cases of modified rabies (*rage attenuée*) which have been described by Laveran, Chantemesse, Sabarthez, and others, as following Pasteurian inoculations, cannot be compared, according to this writer, with the genuine paralytic rabies encountered in this patient.

Murri disclaims the idea of drawing conclusions from a single case, but evidently thinks that, since the patient had recovered from an undoubted paralytic rabies following dog-bite, and since the case was, as far as is known, the only one of recovery from such an attack, one must associate the new application of the remedy with the obtained result, and concede to the intra-venous injections of cord-emulsion a power already shown to be impossible by its hypodermatic use.

T. W. Hime, of Bradford, England, $\frac{6}{\text{June 4}}$ who has translated and published Murri's report, concludes some interesting comments on the case with this paragraph: "If the earlier subcutaneous injections, which were largely of weak material (old medullæ), are accused of causing the disease, then it is impossible to assume that the numerous strong injections direct into the veins could have been devoid of effect on the further development of the symptoms. But the fact is, that the symptoms rapidly disappeared when the strong intra-venous injections were adopted. It is absurd to accuse the Pasteurian method of causing hydrophobia by weak subcutaneous injections while compelled to admit it can cure the disease by strong intra-venous injections. There is no escape from the dilemma. If the antirabic injections caused hydrophobia in Professor Murri's patient at the outset, they also cured him at the end."

The prophesy of Nuttall, and the demonstrations of Buchner and others, on the destructive power of blood-serum on bacteria, have set in motion numerous more or less fruitful inquiries in various laboratories on all sorts of infectious diseases. It is not to be supposed that hydrophobia would escape investigation of this kind, notwithstanding that its germ is not yet discovered. Various interesting observations have been made during the year on this subject. Italy seems to be the centre for such experimental work; and Tizzoni, $\frac{69}{\text{July 7}}$ with his collaborators, Centanni and Schwarz, as well as Evangelista, Poppi, and others, have all recently published valuable reports. Evangelista $\frac{589}{\text{Sept.23,'91}}$; $\frac{2}{\text{Mar.5}}$ tried to ascertain whether

the virus of rabies could be diminished in violence by contact with blood-serum, and concluded that the serum from the dog did not exercise such weakening influence until after twenty-two hours of contact, when the virus became progressively attenuated and finally destroyed. Pigeons' blood was also tried, the whole blood being used, sufficient serum not being obtainable; and in these experiments a destructive influence was observed after only fifteen hours. The destructive power of the serum seemed to vary with the susceptibility of the animal from which it was obtained.

Recently, some most interesting experiments on the action of blood-serum against the poison of hydrophobia have been conducted in the Pathological Laboratory of the University of Bologna, under the observation of Tizzoni, together with Schwarz. [589 Jan.] This observer claimed to have been able, with the serum of animals made immune against hydrophobia, to destroy the activity of the cord-virus not only *in vitro*, but even after inoculation into animals through that most certain of all channels,—the sciatic nerve. More than this, according to these authors, the disease may not only be prevented by this means, but actually cured after unmistakable symptoms have developed. Later on, together with Centanni, [589 May 26; 69 July 7, Aug. 4] they succeeded, by means of absolute alcohol, in extracting from the serum of immune animals a precipitate which contained this peculiar protective agent, associated with some other albuminoids. To ascertain if this agent possessed the property of conferring immunity, direct inoculation of the rabid virus was practiced on the sciatic nerves of rabbits, and eight days after this inoculation the animals were further inoculated with an aqueous solution of the precipitate. The immunizing action of the precipitate was expected to manifest itself after the virus had invaded the central nervous system and after the first symptoms of the malady had appeared. The results showed in every case that the animals inoculated with the precipitate withstood the infection admirably, while the animals which had been inoculated with the rabid virus, but had not been subsequently "vaccinated," died within twenty days of rabies. These results bear a striking resemblance to those obtained by the same observers with the antitoxin of tetanus, and constitute a new link in the chain of evidence toward the immunifying virtues of blood-serum.

It is said that this substance may be collected and kept in a

form available for immediate use at any time. Altogether, it would seem difficult to exaggerate the importance of this discovery, and, while we cannot draw definite deductions until the remedy has been proven of value in the human subject, the authors declare that they await with confidence the application of their method to man. Other experiments have been made by Poppi, 505 June 16 who, with the serum of rabbits, found no destructive effect on the virus of rabies *in vitro*, but observed some effect when the serum from rabid animals was employed. Like Tizzoni, he found that the serum from animals previously subjected to antirabic treatment showed a uniform destructive action on the virulence of the cord in proportion to the amount of Pasteur's emulsion first employed. On the other hand, the serum from animals dead of rabies did not prevent the development of the disease in inoculated dogs, whether given hypodermatically or by intra-venous injection. Finally, he claimed that an emulsion made of virulent nerve-tissue with the serum of an immune animal was not only non-virulent, but had a distinctly favorable action when injected into inoculated animals. These researches are being continued with a view to confirmation.

Centanni, in Tizzoni's laboratory, 589 May 6,7 has described some researches conducted on a line indicated early in the century by a Tuscan physician, Ensebio Valli, who had prophesied the possibility of conferring immunity against disease by means of an artificial attenuation of the virus of the disease, and had experimented on that of rabies with gastric juice. The following is a summary of Centanni's conclusions: 1. Gastric juice has three degrees of action on the virus of rabies. In the first degree death of an inoculated animal is only delayed by a lengthening of the period of incubation. With a more prolonged action, the virus produces in animals a disease which may be considered as milder rabies, which is curable and confers a certain amount of immunity on the subject. This is an immunization different in principle from that of Pasteur. In the third grade of action the virus loses all trace of virulence. 2. With the "first-grade virus" one can, without difficulty, immunize a rabbit even against the "*virus fixe*," a thing which no other method has succeeded in doing. The serum of such an animal has a very high curative power as regards rabies already developed. 3. The "third-grade virus," though quite non-virulent, still possesses almost all its vaccinating power;

greater than that of the Pasteur vaccines. It can also be preserved without loss of power. 4. The process of attenuation is one of true digestion by gastric juice, and it should be possible, in this way, to obtain a vaccinating substance which is not only innocuous, but is even fairly pure. 5. Ingestion of the nervous system or liver of the rabid animal does not, however, confer the least immunity against the disease.

TETANUS.

The literature of tetanus for the year, varied and voluminous as it is, is of interest chiefly for the several reports of extended experimental research on the possibility of producing, through the agency of certain injected substances, not only immunity against the disease, but even cure after its actual inception. Among the investigations which have been made on the power possessed by the blood-serum from immune animals in conferring immunity on other animals those undertaken by Koch's students, Behring and Kitasato, [69 No.49,'90] have been at once the most interesting and the most important. With the blood of a rabbit rendered immune against tetanus they were able to protect mice from that disease, and even to cure them when they were already affected.

The fruitful possibilities of such a discovery are apparent, and require no comment. Recent observations have only confirmed the results previously obtained. Behring [58 Mar.17; 521 June] announces that the certainty of the cure and protection of even such animals as had received more than one hundred times the fatal dose of virus exceeded their utmost expectations. There was no such thing as failure in the result, if only no technical error was made in the treatment. Later, Behring, [58 Mar.17] Kitasato, [58 Aug.30] and Schütz, of the Berlin Veterinary College, [58 Mar.17] working independently, but under the supervision of Koch and with means provided by the Board of Agriculture, undertook further investigations. An interesting feature of Behring's work is, that he seems to have secured a quicker and better immunity against tetanus by selecting for his inoculations cultures of the germ treated with trichloride of iodine. He gives the detail of elaborate experiments, by means of which the proper dosage was determined. By ascending from inoffensive cultures to those which were more and more active, an immunity could be secured against very large doses of the poison. Behring also attempted to see if such large animals as the horse and sheep

could be rendered immune to the disease. His experiments were few, but the results seem clearly to show that this is possible. On this point Schütz, especially, has made careful experiment, and, altogether, there seems to be no doubt that immunity against tetanus can be secured in large animals as well as in small. Unfortunately, these observers have not yet succeeded in curing the disease, once established, in animals larger than the mouse or guinea-pig. Kitasato, in his experiments, demonstrated that the blood-serum from a horse which Behring had succeeded in rendering immune could, on injection, prevent the disease or diminish its intensity in mice and guinea-pigs. The activity of the serum depended on the amount used, and especially on the time of its employment, being much more certain and satisfactory when injected soon after the infection.

At the University of Bologna and in its vicinity numerous studies have also been made along lines similar to those already mentioned. Tizzoni and Centanni, experimenting on animals which resisted well the poison of tetanus, produced in them strong degrees of immunity. The blood-serum from these animals conferred in turn immunity to others more susceptible, and was shown, as well, to have the power of destroying cultures of the germ outside the body. These investigators have succeeded in separating from such blood, by precipitation with alcohol, a solid albuminoid material, to which they have given the name antitoxin, which seems to contain the protective principle existing in the serum and to have for certain small animals an actual curative effect. Lately experiments have been made with this agent with the view of attempting the cure of the disease in man, and various cases have been reported in which it seems to have been used with good effect.

Apparently, the first case of tetanus in man submitted to treatment by Tizzoni's antitoxin was in the hands of Gagliardi, of the Civil Hospital of Molinella, Italy. $\frac{589}{\text{Apr.2}}$ The patient developed tetanus twelve days after receiving an injury to the foot. For the first five days injections of carbolic acid, after Baccelli's plan, were employed, and, there being no improvement, antitoxin was tried. Two injections a day—0.25 gramme (4 grains) at a time—were used. Profuse sweating was noticed, following the inoculations. It is to be noted that in this case some chloral and morphia were used in addition to the antitoxin. Improvement followed the sec-

ond injection, and the patient recovered. During the attack the highest recorded temperature was 39° C. (102.2° F.).

Another very instructive case is reported by Schwarz, from the surgical clinic at Padua. $\frac{50}{\text{No.24,'91}}$; $\frac{2}{\text{Jan.2}}$ A boy cut his finger on August 20, 1891. Proper treatment was delayed, and tetanus developed on September 4th; on the 7th the patient was admitted into hospital, and treated until September 16th with chloral, warm baths, and injections of carbolic acid. At this time the boy had become worse, had marked opisthotonos, difficulty in respiration, and numerous attacks of tetanic spasm. Treatment was suspended, and on the 18th an injection—0.15 gramme (2¼ grains)—of antitoxin from a dog was given. On the 19th little change was noticed. Under chloroform the scar was divided and a bit of tissue removed for an inoculation experiment, which proved negative; 0.20 gramme (3 grains) of antitoxin was given. From this time the patient grew better, and after the 22d rapidly recovered. Schwarz thinks that only three injections were needed in this case, although more were given. It is difficult to deny that the supplementary treatment, the division of the scar, and the duration of the disease did not in some measure contribute to the result.

Two more cases have been reported during the year by E. Finnoti, $\frac{8}{\text{Jan.7,July 28}}$ from Nicoladoni's clinic at Innsbrück. The first was a mild case, which seemed to yield after some time to the injected antitoxin, given in doses of from 0.15 to 0.20 gramme (2¼ to 3 grains). In this case antitoxin from both rabbits' and dogs' blood was employed. The second case was much more severe, and only yielded on the twelfth day after the invasion, and after twenty-three injections of antitoxin had been given, representing a total of 4.80 grammes (74 grains). In this case, as in the first, injection experiments on animals failed to develop tetanus, nor in either case were the proper germs of the disease discovered.

An interesting case, reported by G. Casali, $\frac{589}{\text{June 1}}$ was that of a woman in whom pronounced tetanus developed eight days after an injury to the foot. Tizzoni himself was summoned on the fourteenth day after the injury, when the patient had entered hospital. Two injections daily were given, each containing 0.25 gramme (4 grains) of antitoxin, six in all being employed. Improvement was prompt and positive. Bacteriological examination revealed the presence of the tetanus bacillus.

G. Taruffi [589 Apr.21] also reports a case cured under antitoxin injections, which, like the last, was observed by Tizzoni. The man was very ill, but recovered in eleven days, after six injections, each of 0.25 gramme (4 grains) of the substance. The urine from this case, injected into guinea-pigs and rats, caused death from tetanus in every case. The special germ was also discovered.

Some other cases, less authentic, have also been reported, and a review of whatever has been written on the subject leaves the distinct impression that the antitoxin of Tizzoni has indeed some remedial virtue against tetanus in man. On the other hand, the failures which have followed the few attempts to cure the disease in man with blood-serum, obtained after Behring's method, are rather suggestive that it is not unlikely that the claims of the Italian observers may not stand the test of future investigation. Three cases have been reported in which serum obtained by Behring's method has been employed against tetanus in man, all ending fatally. Two were observed by Rénon in Paris, [262 Apr.; 2 May 28] and the other by Baginsky and Kitasato. Rénon considers that, inasmuch as these cases were unusually severe from the onset, and of much shorter duration than the reported cases of Tizzoni, and since each injection had been followed by marked, if only temporary, relief, that no objection should be offered to the further trial of the treatment.

Kyle, of Philadelphia, [2078 '91; 80 Feb., Mar., Apr.] has recently written on the pathology and treatment of tetanus, and also describes in detail an interesting case of the disease ending in recovery. His work included a series of laboratory investigations on the bacillus of tetanus, especially in reference to its behavior in the presence of certain germicidal substances. Belfanti and Pescarolo had already demonstrated that the tetanus germ resists to a considerable degree the action of corrosive sublimate and carbolic acid, and other observers have noted the same fact. On this point Kyle's work was entirely confirmatory. Further experiment was made with peroxide of hydrogen.

"Ten tubes were exposed to the drug for twenty-four hours; three removals were made from each tube, all of which developed growths. Ten tubes were then exposed to the drug for forty-eight hours, and three removals made from each, and, without exception, all developed growths. The only effect noticeable was, that it

liquefied the growth almost immediately on contact, a gas being evolved."

These experiments were tried on the culture medium of agar-agar and also on bouillon; and Kyle concluded that "peroxide of hydrogen showed no marked effect on the bacillus, except that it seemed to retard its growth." In still other experiments, solutions of hydrochlorate of cocaine, of 4, 3, 2, and as weak as 1 per cent., uniformly prevented the growth of the bacillus after ten minutes' contact, an observation which seems to indicate a peculiar activity of this agent against the organism in question.

SNAKE-BITES.

Venomous snakes are widely distributed over the earth. Of many varieties in kind, appearance, and characteristics, they are distinguished from their innocuous fellows by the possession of a peculiar poison apparatus, consisting of certain secretory glands, venom-glands, and their ducts, together with essential modifications in maxillary dentition. These poison-glands differ in extent and size in different genera. They are two in number, placed on either side, beneath and behind the eye, and above the maxilla. Each maxilla supports a poison-fang or tooth, generally movable, but which may be fixed,—as in the viper,—and which is canaled or grooved for the passage of the poison-duct. When the reptile strikes, the venom is discharged into or against the bitten part. The amount of venom expelled depends, in a general way, on the size of the snake, and also on the length of the interval which may have elapsed after a previous discharge. The general proportion of venomous snakes to those which are innocuous is about as 1 to 8. They are, however, very unequally distributed, being most numerous in tropical countries, especially where dense, rank foliage abounds. India excels in the number and varieties of its snakes. According to Günther, $\frac{2079}{\text{v.22,9th ed.}}$ no less than four hundred and fifty species are here encountered,—about one-third of the total number of species known. Here, too, the largest and most deadly of the venomous snakes are found,—about one-tenth of all Indian snakes being poisonous,—and the mortality from snake-bites in this region being the greatest in the world. In Australia the venomous serpents are more numerous than the innocuous, a noteworthy and altogether exceptional fact, account-

ing for the large number of fatalities from snake-bite in that country. Next to India, South America is most thickly inhabited with serpents, the number of species amounting to about four hundred, the proportion of poisonous to innocuous being about 1 to 8. In our own country the percentage of poisonous snakes is much lower,—about 1 to 14,—and here the total number of species is somewhat less than one hundred. In Africa the number of species does not exceed two hundred, but large snakes are common, and the venomous varieties relatively abundant, being about 1 to 5. Europe, in common with most temperate climates, possesses few distinguishing species, such poisonous reptiles as are found belonging generally to the viper class.

The great snake order has been variously divided by naturalists. Following Günther's classification, we find four sub-orders: (1) Hopoterodontes; (2) Ophidii Columbriformes; (3) Ophidii Columbriformes Venenosi; and (4) Ophidii Viperiformes.

The first sub-order is made up of small burrowing snakes, found generally in tropical and bordering countries. They are of no medical interest, being rarely encountered and never venomous.

The second sub-order, by far the largest, is made up of the innocuous snakes generally. This group is divided into many families, of numerous genera and species, and includes the greater part of all the snake inhabitants of the earth. In the remaining classes the venomous serpents are found. The third sub-order is made up of the venomous Columbines, snakes having the general appearance of non-poisonous varieties, but possessing the typical poison apparatus. To this order, besides the sea-snakes (Hydrophidæ) and several families distributed in Africa and South America, belongs the great and widely-scattered family Elapidæ. To this belong both the Indian and African cobra (Naja), the exceedingly poisonous and aggressive ophisphagus elaps found in India, and the several species of Bungarus, notably the "Krait," of Bengal. Most of the poisonous snakes of Australia belong also to this class, those most dreaded and most dangerous to man being widely known under the names of brown snake, black snake, and brown-banded snake. There are also important African and South American representatives in this group. All varieties of the elaps family are poisonous, but in different degrees; many species are

small, and therefore only relatively dangerous to man, while, in addition, many have narrow mouths, and inflict wounds with greater difficulty. The fourth sub-order includes the so-called viperine snakes. These are divided into two great families, the vipers proper (Viperidæ) and the pit-vipers (Crotalidæ). The vipers proper, except the death-adder of Australia, are limited to the Old World. They are very widely distributed, including almost all the poisonous snakes of Europe, besides some of the most venomous of Asia and Africa. From this family the pit-vipers are distinguished by the presence between the eye and nostril of a more or less well-marked excavation or pit. Although not unknown in the East, the most formidable specimens of this class are to be met with in tropical America. The terrible "*fer de lance*" of the West Indies is a notable example of this family, which includes as well almost all of the North American poisonous snakes,—the copper-head, the water-moccasin, and the whole tribe of rattlesnakes. Rattlesnakes proper belong exclusively to America. There are two distinct genera and numerous varieties, some of which may be found in nearly every State and Territory in the United States. All rattlesnakes are poisonous, but in different degrees; they are all rather sluggish and not apt to strike, except from the coil and under considerable provocation. The poisonous snakes of our own country have been carefully studied by Mitchell, $\frac{2080}{'61,'86}$ Reichert, $\frac{2080}{'86}$ and others. Of any single species, the copper-head (*Ancistrodon contortrix*) is perhaps the most generally distributed, being found everywhere east of the Rocky Mountains. This snake is very active and aggressive, and, although less poisonous than the rattlesnake, will bite under much less provocation. Closely allied to it is the water-moccasin found throughout the Southern States. This is about equally poisonous with the copper-head, is vicious and aggressive, but, because of its habitat, much less to be feared by man.

Barringer, of the University of Virginia, $\frac{2081\ 40}{'91;\ July}$ describes the habits and characteristics of the venomous reptiles of the United States, and notes particularly the single representative of the poisonous Columbines in this country. This snake, the elaps fulvius, is a beautiful little reptile, rarely more than twenty inches in length, and of a variegated and showy coloring. It is found throughout the Southern States, and is variously known as the harlequin-, bead-, or coral- snake. Although not usually considered

dangerous, and mentioned by Mitchell [2082 Aug.,'89] as "too small with us to be dangerous to man," Barringer cites a case reported by Coe [2038 June 27,'91] of death occurring from its bite, and alludes, besides, to other possible cases. This little reptile is described as gentle and never aggressive, only biting under strong provocation. In the reported case the man, a workman, was bitten while handling the snake, and died after eighteen hours, in spite of treatment. "Leaving out of consideration the black, red, and yellow elaps above described, any American snake with a pit between the eye and nostril is a venomous snake, and this is absolutely certain if, in addition to this, there is found one or more ventral plates behind the anus undivided." These snakes are ovoviviparous, and may contain "living young within the gullet, or eggs in advanced stages of incubation in the ovi sac." They have "elliptical pupils placed vertically, a triangular head, narrow neck, and a blunt tail (rattle or no rattle)."

The first important investigation concerning the poison of serpents was made by Lucian Buonaparte in 1846, who studied the poison of vipers, and gave to its supposed active principle the name "echidnine or viperine." From this time until 1861 the subject was scarcely considered, when Weir Mitchell published his elaborate and scholarly report on the poison of rattlesnakes, which stands as the groundwork of whatever is known of the chemistry of venoms. Two albuminoid substances were described by Mitchell as being present in rattlesnake-venom, the one coagulable by boiling, the other not. The coagulum formed by boiling the venom was not poisonous, while the residual fluid on injection proved destructive. Alcohol, when added, also caused coagulation, but this coagulum, when redissolved in water, proved poisonous, but in a diminished degree. Further researches were published by Mitchell in 1868. In 1870 Lauder Brunton, working in Burdon Sanderson's laboratory, failed, with various solvents, to extract from heads of the "fer de lance," which had been preserved in spirit, any poisonous principles, and concluded, on that account, that they were albuminous substances destroyed by coagulation with alcohol. Later on (1873), together with Fayrer, Brunton [2 Jan.3,'91] obtained from the cobra-venom an alcoholic extract which acted, when injected, like fresh poison. He also found the cobra-venom active when coagulated by boiling, although when boiled for a long time and

under pressure its activity was destroyed. Fayrer's admirable study [2083 '73] embraced as well all that was known of the nature of the poison, and called attention to the enormous mortality from snake-bites in India,—a mortality which approximates, according to a recent report from the same source, [2 Mar.19] not much less than twenty thousand human beings annually. Together with Vincent Richards, Fayrer made numerous experiments with injected venoms, and noted differences in the poisonous properties of different specimens. Wall [2084 '83] published a review on the subject of Indian snake-poisons, with a series of experiments dealing particularly with temperature effects on venom.

Three proteid substances were found by Mitchell in crotalus-venom, principally by a process of dialysis. One was an inert albumen, and, of the remaining two, the first venom peptone was highly poisonous and very diffusible, passing, on injection, at once into the lymph- and blood- channels. The heart's action was always depressed, and could be stopped in diastole with large injections. With ordinary doses a reaction followed the temporary depression, the heart's action became stronger, and a progressive involvement of the nervous system ensued, death finally resulting when the respiratory centre was reached. This so-called peptone has been lately considered as more properly an albumose (Wolfenden), since it gives a precipitate with acetic acid and ferrocyanide of potassium. It produces little local effect, does not seem to modify the coagulability of the blood, but, by lowering tissue-resistance to bacterial agencies, encourages, to a marked degree, œdema, putrefaction, and gangrene. The other poisonous product, described by Mitchell as venom globulin, differs from the albumose, in being less diffusible, but more local in its action. It has a distinct destructive influence on the red corpuscles, and renders the blood incoagulable. Unlike the venom peptone, it may be swallowed with impunity; but, injected into tissue, it produces great destruction, dissolving animal membranes and causing quick hæmorrhages and ecchymoses. Blood-pressure is lowered, the nerve-centres affected, and, finally, when sufficient poison is injected, death follows by asphyxia. These poisonous proteids are most effective as associated in the fresh venom, and are supplementary to one another. While not likely identical in different species, they seem generally present in the venom of all poisonous snakes, but in very different

proportions. Thus, the venom of the crotalus contains but little peptone and a relatively large quantity of globulin. Quick local effects follow its bite, and serve as a means of diagnosis. With the bite of the cobra, on the contrary, but little local action is seen, and in this snake the conditions are reversed, there being a large amount of venom peptone and a relatively small quantity of globulin. As is said by Brunton [2 Jan.3,'91]: "Both cobra and crotalus venoms kill by paralyzing the respiration, although they also weaken the circulation; and, when much has been injected, the patient becomes weak and collapsed, vomits, and dies, with or without convulsions. If the poison has been less in quantity, the local symptoms, in the case of poisoning by the crotalidæ, increase, the swelling extends, symptoms of blood-poisoning appear, and the face becomes swollen and puffy, the pulse very feeble, and the respiration labored." Estimates as to the quantity of venom necessary to destroy life are interesting, but inconclusive. It has been said that less than 3 minims (0.18 gramme) of rattlesnake-venom will kill an average man, and that a much smaller quantity of cobra-venom will have the same effect. As a rule, however, the species of snake is more important than the amount of venom injected, although a large snake, by possessing more venom, is relatively more dangerous than a smaller one.

Snake-venom, injected into venomous snakes, does not seem to produce poisoning; while, on the other hand, innocuous snakes may be killed by such injections. In some interesting experiments, Sewall [178 V.8] has shown that animals may acquire a resistance to the action of venom, by its previous injection in quantities too small to kill. Calmette [195 Mar.; 208 Apr.23] and others have extended these observations; and it would seem that a real immunity is not in this way produced, but rather a toleration, such as is seen in man, in the use of other poisons, as opium or arsenic. Jacolot [195] states that, at Tuxpam, on the Gulf of Mexico, there are men called "Curados de Culebra" (safe from vipers), who may be bitten by venomous snakes without effect, as they have been previously inoculated with the poison of these animals. These vaccinations are practiced as follows: The patient takes, first, the bulb of a native plant called "mano del sapo" (toad's hand), a Dorstenia; then the inoculation is made with the venom-tooth of one of the most poisonous snakes. Jacolot was at Tuxpam in 1867, and found

this preventive inoculation an old practice among the natives of that region.

Among the most interesting effects of snake-bite are the septic processes, which, in many cases, attend or follow the received injury. These are always to be considered in the treatment of cases after the first danger is averted; and, while greatly encouraged by the introduced venom, it should not be depended on, for the venom itself is not the cause of the sepsis, which results from the additional presence of one or more of the various pus-forming organisms. With the demonstrated destructive influence of snake-poison on animal tissues, we can easily explain the putrefactive changes which result when once an infective agent is supplied; but there are, nevertheless, many unexplained and interesting phenomena of infection which follow not only the bites of snakes and other reptiles, but those of many other animals as well, and even the stings of insects.

The curious resemblance existing between the poison apparatus of snakes and our ordinary means for hypodermatic injection has been often remarked. Obviously, then, bearing in mind that in snake-bites the introduced fluid is a potent and rapidly diffusible poison, most cleverly injected, it is only by very radical and energetic procedures that we can hope in any way to combat its effects. Toward this end, besides the usual and always valuable preliminary measures of ligature and excision, we may direct our efforts along two distinct lines: first, to attempt in every possible way to keep alive the bitten individual until the effects of the poison are dispelled; and, second, to endeavor by the use of chemicals to mitigate or destroy its potency. As a means of sustaining life by bolstering and supporting a flagging nervous system strychnine, in one form or another, would naturally suggest itself.

Some years ago, in a number of injection experiments with various agents, carried on by Fayrer and Richards[2085] against cobra poisoning, this drug was tried among the rest, but was not found to have any material influence on the effect of the poison. Later on, Weir Mitchell, [2082 Aug.,'89] and, still later, Feoktistow and others, tried the same agent with other snake-poisons with like negative results. On the other hand, clinically, the drug seems to have been often used with benefit at one time or another, and it forms the basis of a noted native South American cure. General atten-

tion was, however, not directed to this drug in this connection until about four years ago, when Augustus Müeller, of Yachandandah, Victoria, [267 Apr.15,'89,et seq.] reported several cases in which the agent had been used with good effect, and recommended its further trial. In a later report, Müeller stated that twenty-five years' experience had placed it beyond doubt, in his mind, that snake-poison concentrated its action on the motor and vasomotor nerve-centres, that all the symptoms found a ready explanation on that basis, and that strychnine was the rational antidote against the effect of that action. Large doses were required, given hypodermatically and at frequent intervals; quantities of the drug, under ordinary circumstances toxic, had only good effect in the presence of the snake-poison. In many cases it had been necessary to give, of course, in divided doses, from $\frac{1}{2}$ to 1 grain (0.032 to 0.065 gramme) of the drug before the scale had been turned in favor of the patient. These reports have excited great interest in Australia, and many trials of the agent have been made, following Müeller's plan. Bancroft [2086 Sept.19,'90] denies not only that strychnine can do good in cases of snake-bite, but rather, by adding poison to poison, that it hastens the death of the victim. Taking into consideration the comparative rarity of instructive cases of snake-bite, a careful study of some scores of published cases in which this drug has been used persuades us that, in Australia, at least, death from snake-bite under strychnine treatment is very rare, and that it occurs not from the drug, but from delay or timidity in its use. A recent report from India confirms the value of the drug in cases of viperine poisoning in that country, while against the bite of the cobra its good effects are more doubtful and have not been shown. From these published reports, it is not too much to say that snake-venom and strychnine are physiological antagonists, and that in every case we should use strychnine hypodermatically, in doses more or less large and frequent, according to the gravity of the symptoms.

Recognizing that failure of the respiratory action is the immediate cause of death, Weir Mitchell attempted to prolong life in injected animals by means of artificial respiration, and succeeded in this way in maintaining the heart's action for a considerable time. Later on, Brunton and Fayrer, with the hope of sustaining life until the poison could be eliminated,—a feasible procedure in curare poisoning,—succeeded, by artificial respiration, in keeping an

animal alive for ten hours; and a later experiment by the Indian Commission was even more successful, the animal, apparently moribund, recovering partial motion and sensation, and death being delayed for some twenty-four hours.

Brunton speaks of the violent vomiting, mucous-membrane hæmorrhages, and other marked symptoms which follow poisoning with snake-venom, and which demand attention, as well as the depression of heart and respiration. Since the venom (cobra) has an extraordinary irritant action on mucous membranes, even causing vomiting in the frog ("very unusual in that animal"), it may be that the "poison is eliminated by the mucous membrane of the stomach in much the same way as tartar emetic or apomorphine would be." He suggests that one should try to remove, if possible, any poison that might have been eliminated, and recommends thoroughly washing out the stomach with whisky or brandy. He thinks that the value of alcohol—so generally used in snake poisoning—is local, since it coagulates any excreted venom and prevents its re-absorption.

The possibility of successfully neutralizing poisonous venoms in bulk has been demonstrated time and again. Various chemicals, as bromine, iodine, the alkaline hydrates, potassium permanganate, and the chlorides of gold and mercury, have been used in the hands of different investigators to produce this effect, but such attempts as have been made to destroy the poison when once introduced into the body have not been followed by any striking success.

Some years ago, A. J. Wall attempted some injection experiments against inoculated venom with chloride of gold, an agent which, in very small quantity, completely neutralizes cobra-venom *in vitro*. His results were negative. Recently, Calmette,[195 Mar.] Director of the Bacteriological Institute of Saïgon, in Cochin China, has published in detail a series of experiments on various animals, in which he attempted, with the same agent, to destroy or modify the effects of introduced venom. The poison used was that of the cobra, and the injections were made either immediately following the inoculation or, as in a few instances, after a delay of five or more minutes. The injections were practiced in and around the seat of injury, and about a ligature employed to stay the course of the poison. In most of the experiments a 1-per-cent. solution of

the salt was used, with a much weaker solution (0.2 per cent.) for intra-venous injections. From 8 to 10 cubic centimetres (2 to 2½ drachms) of the solution was usually employed on rabbits, guinea-pigs, rats, fowls, pigeons, dogs, and monkeys. In the animals injected immediately after the inoculation recovery was the rule; while after any delay, however short, four out of five died. Although Calmette concludes that it is possible to cure animals suffering from the effects of snake-poison by neutralizing the venom that has been absorbed by subcutaneous injection of chloride of gold, the claim seems hardly substantiated by his own experiments. Kanthack, of the University of Cambridge, $^{6}_{\text{June 11}}$ has published a report of a series of experiments, with entirely negative results. He had previously experimented in India with chloride of gold without effect, and extended his investigations on the receipt of Calmette's paper. He concludes that the salt is entirely useless as a cure or preventive of cobra poisoning, but admits that it may, to some extent, modify the effect of the poison, if administered immediately after the inoculation.

Another agent used by injection to neutralize inoculated poison is the permanganate of potassium, already mentioned. This salt seems to have been first employed in this connection by Lacerdo, of Brazil, who recommended the immediate injection into and around the wound of a 1-per-cent. solution of the salt. Richards, in India, has used the drug in the same way in cobra poisoning, but in much stronger solution (5 per cent.). Numerous other instances are recorded of the employment of this salt, and it has been considered the best chemical antidote against venoms. Its actual value, however, is not yet proven, and its toxic qualities in over-doses should be constantly borne in mind.

Justin Karlinski, of Stolar, $^{54}_{\text{Aug., '90}}$ has reported favorably on the use of a 1-per-cent. solution of chromic acid about the bitten part in viper-bites. While viper-venom is undoubtedly less active than that of some other poisonous serpents, this agent seems certainly to have neutralized its effect in the reported experiments. Kaufmann, of the Alfort Veterinary College, $^{6}_{\text{28}}$ has recently been awarded the Orfila prize for his further discoveries of the value of this agent against the same poison.

TRAUMATIC NEUROSES.

By J. A. BOOTH, M.D.,
NEW YORK.

THE articles upon this subject during the past year present no new facts and are repetitions of former conclusions. The principal discussions have been those concerning special symptoms, more especially the narrowing of the visual field, the anæsthesiæ, and the question of simulation. For the past six years there has been in vogue, in Germany, a pension law, and perhaps this may account for the numerous cases reported in which the above symptoms are found, either as simulation or exaggeration.

Notwithstanding the great number of contributions opposing the generic term "traumatic neuroses," and the fact that some of Oppenheim's statements have not held ground, still the basis remains the same, and the term is the most acceptable at present, although it may be modified or changed in time.

Semeiology and Diagnosis.—Medical literature is still flooded with the reports of cases of traumatic neuroses, but, in a large majority of such records, the diagnosis is hastily made on a superficial examination and insufficient observation, thus tending to render obscure, rather than to elucidate, this interesting subject. Physicians should be most thorough in the physical examination, especially in regard to the back; to this attention has already been especially called by F. X. Dercum, of Philadelphia. $^{5}_{\text{Sept.,'91}}$ Again, this year, Dercum describes an interesting case, with many instructive remarks. $^{242}_{\text{Jan.}}$ The symptoms, objective and subjective, were identical with those so often presented, and the entire absence of any element of litigation makes the case extremely valuable. Dercum is of the opinion that the scientific mind has been too much occupied by the various symptoms, while factors less recondite, less difficult of interpretation, have been neglected. The symptoms found in traumatic neuroses are now receiving careful scrutiny, and during the past year much time has been given to discussing

the value of the narrowing of the visual fields, the anæsthesiæ, and their simulation. The symptom found by Oppenheim—the limitation of the visual fields—is still the most disputed point. Schultze, in 18 cases, found it present in 14; in 4, doubtful. He thinks it possible to simulate the symptom, but doubts its importance. Lewek had 5 cases, but in only 1 was this symptom met with. Eisenlohr thinks it of but very little importance. Moebius regards it, and also anæsthesia, as a typical hysterical symptom, and not to be expected in traumatic neurasthenia. In support of this view, Neumann, Donath, Freund, and Keyser have found narrowing of the visual fields, but in a majority of the cases hysteria was present. Pflüge has repeatedly demonstrated that hysteria is generally present, and in these cases hemi-anæsthesia is also found. Wilbrand maintains that he has found it in simple neurasthenia. Freund reports 18 cases, in 10 of which there was narrowing of the visual fields; in 4 cases it was absent, and 4 were not examined. A. Nonne (69 July) found the symptom present in 9 cases, absent in 5, and in 3 cases it was part of a classical hysteria; while in two others there was a cerebral change, in which contraction is not rare. One case had the typical symptoms of cerebro-spinal neurasthenia, in which he regards it as a common symptom. Psychic anomalies were only found in one case. Nonne concludes that there are various organic symptoms which may arise in the so-called cases of traumatic neuroses, viz., facial paresis, eye-muscle paresis, impairment of intellect and memory, pathological increase in the tendon reflexes, pupillary rigidity, etc. He also assumes that all these belong under the heading of traumatic neuroses, and regards hysteria after trauma as of slight frequency. Wilbrand showed 29 cases before the Hamburg Medical Society, in all of which there was more or less narrowing of the visual fields. He thinks that the existing difference of opinion among authors arises from the fact that the same-sized objects are not used in the examination. Cases of slight narrowing are of just as much importance, if not more, than those in which there is a greater degree, as they are more difficult to simulate. By varying the examination, one may exclude simulation. Bruns argues that some place the cases described by Oppenheim on the same plane with those of simple local neuroses, in which visual narrowing must not be expected, as the trouble is not

central. Such cases have brought about a great deal of confusion. Eisenlohr takes the same stand. Schmidt-Rimpler, [69 June 16] of Göttingen, in speaking on the simulation of this symptom, states that it was present before the accident law in Germany, and before the establishment of traumatic neuroses. He does not agree with Oppenheim, and does not think that it can be successfully simulated, even by a skillful or well-schooled simulator. During the past year a number of simulants were discovered among the recruits in the militia. The testing of the visual fields is a very confusing one, and should be repeated many times. Minute instructions are given by Schmidt-Rimpler, as to the manner of testing and the mistakes that are liable to be made. Huebscher [69 Apr.28] calls attention to motor asthenopia as an important objective symptom. Six typical cases of traumatic neuroses were examined, and in all failure of the power of converging the eyeballs was present. All the cases were the results of railroad accidents. At the International Congress at Berlin there was an almost unanimous opinion that narrowing of the visual fields and sensory disturbances had been overestimated.

Lauenstein [69 Apr.14] has lately advocated chloroform narcosis as a means of unmasking simulated traumatic neuroses, and cites a case, in illustration, in which rigidity disappeared under the above test, causing him to conclude that the patient was a malingerer. Friedmann [75 May 1,'91] contests Lauenstein's deductions and the value of chloroform narcosis. He cites the case of a man who had clonic spasm of the hands. These ceased during chloroform administration, but on recovery from the narcosis, the movements returned. As a basis of his belief in favor of these rhythmic contractions originating in the brain-cortex (independently of volition), he alleges that he produced suspension of athetoid movements in a paralytic, by passing a constant current through the fronto-parietal regions.

Rumpf suggests three tests to determine the reliability of symptoms: (1) pressure on painful points, which, in true neuroses, elevates the pulse-rate; (2) quantitative reduction of galvanic excitability of motor nerves; (3) faradization of a nerve-trunk, fibrillary contraction of muscle being found to last some time after operation. The number of true neuroses is small; more than 33 per cent. are hysterical, about 10 per cent. are malingerers, and not more than 5 per cent. suffer from permanent disease. A. Neu-

mann [57 Aug.14] reports the following interesting case of severe traumatic hysteria:—

Male, 38 years old, railroad employé. In a collision received a slight shock. Was taken to a hospital, and after a few days discharged cured. Shortly after developed morbid fears, could not work, dreamed of accidents, and had attacks of globus, stuttered, and for days at a time remained dumb. Examination revealed complete anæsthesia and analgesia in various parts of the integument. Anterior half of tongue analgesic and posterior part hyperalgesic; marked concentric narrowing of right visual field, moderate of left; would talk in response to suggestion. Improvement after several months treatment by suggestion and faradism. Goldscheider [75 Aug.] recommends the following plan for deciding between actual and feigned analgesia or hyperalgesia: The indifferent electrode attached to a faradic battery is a large metal plate; the other a long wire brush, the latter being placed in such a manner that half the length of the brush rests on the unaffected skin, the remainder upon the part said to be numb. With a current strong enough to cause pain, the electrode is slightly raised from the normal side without the patient's knowledge; cessation of pain necessarily follows if the skin in contact with the electrode is analgesic.

A. Elzholz [8 Feb.18] reports the following case, which is of some interest:—

Railroad conductor, 24 years old, slipped off a train, falling on left side. Found unconscious and taken to the hospital. The following day expectorated bloody material and bled from left ear. After leaving the hospital there developed, a month later, hammering sounds in head, seeing of many-colored discs, cyanosis of the left hand, coldness and formication in left half of body, and profuse perspiration on slight exertion. On examination, uvula pointed to right; paresis of left face; sense of smell and taste diminished on left side, concentric narrowing of visual field on left side; analgesia of left half of face; left hemi-anæsthesia. The condition of right facial nerve was noteworthy, as voluntary innervation was completely preserved, while the mimic function was suspended. Elzholz thinks that a functional paralysis explains this, being indirectly due to a lesion of the cortical area, in that part where the sensory, motor, and trophic centres lie near each other.

Simulation was excluded on account of the large number of objective symptoms.

Etiology and Pathology.—The greater number of authors do not believe in a specific term, sharply defined, in the sense of Oppenheim and Strümpell. They recognize that the combined nerve psychoses, said by Oppenheim to be especially common, may occur, but reject the term "traumatic neuroses" as an etiological designation. Schultze [41 Apr.] combats the view that there is a typical complex of symptoms, and regards as unavailable the theory of Strümpell, that there is a local trauma neurosis dependent upon central disturbances. He gives the following conclusions: 1. Various psychoses and neuroses may be produced through a trauma. There is, however, no perfectly typical, sharply-defined type of disease which may be called traumatic neurosis; therefore, it is better to employ the name of the special morbid condition present. 2. Forms of disease to which have been applied the term "traumatic neuroses" are not rare, and especially cases where a slight peripheral trauma existed: this condition may result from simulation and exaggeration. Oppenheim and Strümpell approve of the functional theory, and both regard the disease as a functional disturbance of the cerebral cortex, caused partly by the direct effect of the injury and partly by a psychical alteration. The altered mind absorbs the sensations originally from the direct effect of the injury and creates from them impressions which produce paralysis. Meynert gives as a cause of the vasomotor disturbances the psychical insult, which, acting as an irritant upon the vasomotor centre in the medulla, reacts with impulses to the vessels, by reason of which there is a contraction in the circle of Willis. Schultze thinks that there would be greater clearness if neuralgia, spasms, contractions, paresis, etc., were regarded as reflex symptoms or the expression of a hysteria.

P. C. Knapp, of Boston, [99 Sept.1] in a paper read before the American Neurological Association, states that there are various distinct nervous affections due to injury, but that no one term can be applied to all. He attempts a classification based upon ninety cases, in half of which there had been no question of litigation. Pain in the back was present in fifty-six cases. Five cases were due to direct injury to the cord, producing paraplegia. Thirteen cases were regarded as of distinctly cerebral origin. Twelve cases

were of organic origin. Twenty-six cases were classed as neurasthenia, seventeen cases as hysteria. The litigation cases presented no symptoms differing from those seen in the non-litigation cases.

Beard, of Minneapolis, after considering carefully the various opinions held by other authors, arrives at the following conclusions: 1. The term "spinal concussion" indicates a transient molecular disturbance of the cells of the cord. It is a misnomer as applied either to the actual sequelæ of such disturbance or to the many cases of nervous shock which, voluntarily or involuntarily, simulate railway spine. 2. Actual concussion of the cord is not easily induced, and, probably, only by a direct violence. 3. No concensus of symptoms can be declared which can justly be denominated spinal concussion or railway spine. 4. Lesions of the cord resultant from this cause vary with the intensity, quality, and seat of the injury. They are sometimes vascular, sometimes meningeal, and sometimes involve the actual substance of the white-fibre column or the gray matter of the cord. 5. Although these lesions are not always discoverable, their motor, sensory, trophic, or reflex results often prove their existence and demonstrate their location.

In regard to the pathology of the disease, no material advance has been made. The following probably represents the theories of the majority of observers: The primary effects of an injury are cellular or cortical and not in the deeper structures, though Meynert has advanced the theory that many of the symptoms can be attributed to alterations in the "arteria-choroidea." Julius Mickle $_{\text{Spring No.}}^{47}$ states that from the shock of a blow may come singly, or in succession, (*a*) jar, shake (concussion as a cause), with its hypothetical molecular change of structure as a primary effect, and with it more or less suspension of some functions of the brain and spinal cord; (*b*) the basis of traumatic cerebral and spinal neurasthenia or other neuro-psychoses, namely, some molecular alteration of those organs; and, (*c*) as secondary or late effects, subacute and chronic demonstrable organic brain disease. No cases with autopsy have been reported during the year, and so further confirmation is still wanting of the severe effects which are said to follow in these cases.

Prognosis and Treatment.—There has been no change in the opinions of the different authors as to the prognosis in this disease.

In general it is more favorable than formerly, depending upon the variety. Those cases are most promising in which the symptoms attain their intensity soon after the injury, while a long interval between the receipt of the trauma and the development of the spinal symptoms is unfavorable.

Much more light is necessary before a fair judgment can be given. Eliminating the cases of pseudo-concussion and those in which slighter irritative symptoms develop, the remainder should receive a very guarded prognosis, which may be dependent upon the extent and gravity of their paralytic disorders. Singer, in 29 cases, cured 3. Seven were completely capable of work, 11 partly recovered, and the rest were not improved. Eisenholz and Schultze do not regard the prognosis as bad as do others. Freund has cured several cases. Dubois considers a cure rare. It is not easy to decide this question, as the local and general neuroses are apt to be confounded. Coester $\frac{4}{\text{No.31}}$ has reported the case of a lad, 17 years old, in which, following a contusion of the ring finger of the right hand, anæsthesia of the right upper extremity, and of the right side of the head, face, and trunk, to the level of the seventh rib, appeared. Tactile sensibility, thermic sensibility, and sensibility to pain were abolished. The muscle sense was preserved, and there was no loss of power or wasting. The condition disappeared after six weeks of application of strong currents by means of the faradic brush.

There are no new suggestions concerning the treatment of these cases. The nature of the trouble necessitates a varied treatment according to the form assumed. Baths, cold frictions, central galvanization, peripheral faradization, and the internal use of tonics, etc., all tend to do good and in some cases effect a cure.

Medico-Legal Aspects.—The frequency of simulation is still disputed, and the high percentage (33 per cent.) formerly found by Hoffmann and Schultze is no longer given; the latter author now gives 10 per cent. Rumpf, of Marburg, also gives 10 per cent. Hoenig regards simulation as enormously frequent, even going so far as to state that there are teachers for the purpose. He regards it as rare in countries where there is no "accident law."

Lewek, in 25 cases, failed to find 1 of simulation. A Nonne, in 14 cases, found none, and exaggeration in 2. Putnam

and Knapp, of Boston, consider it of rare occurrence. Seeligmüller, of Halle, still places his estimate at 25 per cent.

Schultze believes that positive objective criteria, present uniformly in every case, for determining the existence or absence of simulation, cannot at present be formulated.

ANTISEPTICS AND SURGICAL DRESSINGS.

By JOHN H. PACKARD, A.M., M.D.,
PHILADELPHIA.

While it is true that the antiseptic system has won general recognition, and has become an integral part of the practice of the majority of surgeons all over the world, it seems to me that the time has not yet arrived for its advocates to feel that their work is done. There still exists a tendency, partly due to the skepticism expressed by a few leading specialists, to regard it as a cumbersome method of attaining mere cleanliness, which alone is declared to be the condition on which the best results can be secured. And by many surgeons the whole thing is looked upon as a fashion, to which they conform in a perfunctory manner, without any profound conviction of its value. Others, again, believe in the principle, but think the methods are in a transition state, and that much is yet to be done before they can be fully accepted. I regret to say that I know some men who still practice surgery without any antiseptic precautions whatever.

Were the only claim of the antiseptic system that it insured or hastened the healing of wounds, or that it rendered operative interference safer, or that it prevented suffering on the part of patients —on any one of these grounds it would deserve the favorable consideration of surgeons, and its acceptance would be an imperative duty. But it does more than all this. Many are the cases in which it is the direct means of preserving life; without it a fatal issue would be inevitable.

An able editorial $\frac{80}{\text{Nov.}}$ gives such a valuable review of the actual status of the life-saving value of the antiseptic method that it is certainly entitled to the space accorded it in these columns: "From the time when Listerism was generally introduced, with all its troublesome technique, its powerful germicides, its cumbersome apparatus, its elaborately-prepared dressings," says our esteemed contemporary, "there has been a steady tendency to

simplify methods and to do away with drugs which occasionally produced systemic poisoning, to substitute perfect cleanliness for antisepsis, and to prevent the entrance of pathogenic microbes into wounds. Together with simpler methods have come more satisfactory results. Death from mercuric and carbolic poisoning, or even from iodoform absorption, is rare,—not only in medical literature, but also in actual practice. The credit of simplifying methods and of obtaining better results is undoubtedly due in great measure to the teachings of abdominal surgeons, and it is safe to predict that certain of their practices, authorized by their published results, will generally obtain in the performance of ordinary surgical operations.

"It is well recognized that pathogenic microbes rarely enter a wound through the medium of the air. The word rarely is here used advisedly. Infection by such means is, without question, possible; that it has taken place repeatedly is highly probable. The chances of its occurring in a given case, however, are so slight that especial provision against this form of infection need not be taken *unless* the operation is of such a nature, or is performed in such a region, that the slightest infection is liable to result seriously. For instance, in operations upon brain-tissue, or in those involving exposure of a knee-joint, or in operations upon diabetics, not only should every precaution be taken against probable sources of contagion, but every possible source should be excluded; hence the chance of air-contagion should be duly considered, and should be provided against by removing from the operation-room all dust-holding fabrics, such as carpets and curtains; by wiping walls, furniture, and floor with damp bichloride towels immediately before operating; by excluding those whose garments are liable to be septic, and by keeping doors or windows closed from the beginning to the end of operation. In hospitals this end should be attained by reserving an operating-room exclusively for this class of cases.

"The use of powerful germicides upon wound-surfaces is happily becoming less popular, as the full action of drugs of this character is generally recognized. It is now well proven that a wound surface which has not been unduly irritated is able not only to provide promptly for definite healing without undue serous exudation, but is also able, by the antiseptic action of its living

cells, to destroy, or at least render innocuous, the few germs which are liable to gain entrance in the course of an operation conducted according to modern methods. It is also shown that, while strong antiseptic lotions (bichloride 1–2000, for instance) may destroy the germs which gain access to the wound, such lotions lessen or destroy the resistance of living cells, occasion profuse serous discharge, and distinctly delay healing. Hence the tendency of to-day is to use, after the first incision, weak bichloride solutions, or simply sterile lotions, such as boiled water or boiled normal salt solution. Moreover, since profuse irrigation of wounds encourages a freer exudation than is required for prompt healing, these lotions are used as a medium for cleaning sponges or tampons rather than as direct washes for wounds.

"With the advent of Listerism began the reign of catgut as an absorbable ligature material. Of late years this material has fallen under suspicion. It is shown that the commercial preparation of this ligature material exposes it to the danger of infection; that the ordinary methods of sterilizing it do not always succeed in destroying the germs lying in the central portions of the thickest strands of gut; that it becomes liquefied in the substance of a wound, and there offers an almost perfect culture material for any germs which have gained entrance by chance infection or have been carried in by the gut.

"Silk then became popular with some surgeons. It possesses the advantages of being stronger than gut of corresponding thickness, of being readily and thoroughly sterilized, of tying down more easily and more tightly. Its disadvantage lies in the fact that it is absorbed slowly or not at all, remaining as a foreign body. Hence, if there be any infection, sinuses running down to silk ligatures may remain for months or years, until the ligature is removed or discharged spontaneously. The objections to silk are sufficient to prevent it from coming into general use. In answer to the objections to catgut, it may be stated that trouble with this material generally comes from faulty preparation. Gut of medium thickness which has been rolled in loose coils and stored for weeks or months in oil of juniper, which is then stored for months in absolute alcohol, and which is finally kept for one or two days in a solution of bichloride of mercury in absolute alcohol (1–1000), may be considered thoroughly reliable. A long soaking in

mercurial alcohol solution makes it so weak that it is practically useless.

"However, since either gut or silk is a foreign body in a wound, and hence objectionable, the tendency of the day is to dispense with all ligatures as far as possible. It is found that the pressure of the hæmostats is sufficient to control most vessels; if not, a few twists will definitely stop bleeding. Hence breasts are excised, extensive tumor operations are performed, even excisions of joints are completed, often without the placing of a single ligature. Murdock reports hundreds of cases of major amputations without a single consecutive bleeding, torsion being exclusively relied on to check hæmorrhage. Since crushed and devitalized tissues are practically foreign bodies in wounds, the proper use of the hæmostats is exceedingly important. The catching of a mass of tissue in the region of a bleeding vessel is to be avoided not only because it needlessly destroys tissue, but also because it prevents the proper action of the instrument by interposing a soft pad between the blade of the forceps and the vessel, the walls of which unyielding pressure is designed to crush. Where possible, the vessel should be seized alone, or, where this is not practicable, as little surrounding tissue as possible should be taken up.

"The necessity of providing for drainage is no longer as urgent as was the case a few years since. In all clean-cut wounds, such, for instance, as those made in ligating an artery in its continuity, or in stretching or resecting a nerve, or in enucleating an encapsulated tumor, drainage is generally dispensed with. Even after such operations as excisions of joints, resection of bones, fixation of ununited fractures, and amputations, provided there has been no previous infection with the ordinary pus-microbes, some surgeons close without drainage. In case general and local symptoms subsequently denote suppuration in the depths of the wound, exit for pus is readily provided for by breaking up the slight union at one or more places by means of hæmostats or dressing-forceps and inserting a tube.

"The objection to the drainage-tube lies in the fact that it is a foreign body; that it provides a free communication from the surface to the deepest part of the wound, hence favors secondary infection; that it leaves a more or less permanent sinus, the walls of which are prone to become infected from the skin, which cannot

be permanently and thoroughly sterilized; that when it is inserted an extra dressing, hence additional disturbance, is required for its removal. In spite of these objections, drainage, either by tubes or by iodoform gauze, or other means, is absolutely necessary in certain cases, particularly when the operation field has been already infected, as in joint disease accompanied by sinuses; or when after operation a suppurating cavity is left which cannot be obliterated by pressure, as in empyema; or when the operation has been extensive and prolonged and the tissues have been subject to much rough handling, or to strong antiseptic irrigations. The general tendency of the day is, however, toward dispensing with drainage whenever this is possible.

"The closure of the wound has recently received more attention than was formerly given to it. Since during the insertion of stitches there is, in addition to a certain amount of oozing from the whole wound surface, some bleeding from the needle-punctures, and since even a small amount of blood delays prompt healing, some provision must be made to prevent even this moderate hæmorrhage into the wound. This may be accomplished by an assistant making firm pressure over the entire wound surface while sutures are being placed, or, better still, by tightly packing the wound with sterile gauze strips, the ends of which are brought out at one end of the incision.

"When the wound is nearly closed these strips are withdrawn, firm pressure is made over the entire operative area, the last stitch is tied down, and a firm dressing is applied. Accurate coaptation of the skin surfaces is a matter of very great importance. Eversion means a granulating surface which slowly cicatrizes, inversion absolutely prevents union; accurate coaptation without drainage will, in a few hours, be followed by adhesions which will prevent infection, even should the skin surface be bathed in septic material. In applying the sutures it is important to avoid bruising or devitalizing the skin by tightly grasping its borders in dissecting forceps; such a procedure often prevents prompt healing. It is best to pick up skin edges with the fingers, or, when this is not possible, the grasp of the forceps should be no tighter than is absolutely necessary. The popular suture material for general work is probably silk-worm gut. This is strong, smooth, easily sterilized by bichloride (1–2000) or boiling, and, unless very great tension be

exerted, will retain its position with the first double turn of a surgeon's knot. It is somewhat too rigid for sutures which are purely superficial and designed only for skin coaptation; here fine Chinese twist, or, in some cases, horse-hair, will give better results. Either of these substances may be sterilized by boiling. The dressings employed show the same tendency towards simplification as the other methods employed. Most surgeons still prefer to place over the line of incision a smooth surface, such as gutta-percha tissue, or waxed paper, or, best of all, Lister's protective; this does not interfere with discharge, and prevents the gauze from sticking to the sutures and to the incision and occasioning pain and local irritation when it is removed. This smooth surface may be sterilized by dipping first in bichloride (1–2000), then by rinsing in carbolic acid (1–40), or in sterile water, or in salt solution. Over this is placed the gauze; what is chiefly required of this is that it should be absorbent. Many surgeons prefer that it should contain no antiseptics, sterilizing it shortly before or during an operation by boiling or by steam heat; others, and perhaps the majority, first sterilize it; then wring it out of bichloride solution, varying in strength from 1–3000 to 1–10,000. The stronger solution is sometimes followed by severe dermatitis. The number of layers of gauze required varies in accordance with the amount of wound-discharge expected. After a simple incision, eight or ten would be sufficient; after prolonged or extensive operations, twenty or thirty may be required. Over the gauze comes a thick layer of absorbent or bichloride cotton, and, finally a neatly-fitting bandage is applied. Such a dressing is often left on from four to thirty days. In ordinary cases the stitches are removed in six or seven days, and the wound is found entirely healed.

"The sterilization of instruments is accomplished by boiling in a 1-per-cent. bicarbonate-of-soda solution—roughly, a heaping teaspoonful to the pint of water—for twenty minutes; they may be taken directly from the solution for operation. The addition of the soda prevents the instruments from rusting and slightly raises the boiling-point of the water.

"Sterilization of the hands is best accomplished by cleaning of the nails and thorough and repeated washings and scrubbings in hot soapsuds, frequently changed. The washings should last for from six to ten minutes. Afterward the hands may be washed

in alcohol, then in bichloride (1–1000), though the soap and water seem to be the most efficient cleansers.

"From the foregoing it will be seen that the practitioner can feel fairly certain of securing good results with means which he has constantly at hand. The importance of chemical antiseptics has become less; the necessity for rigid cleanliness and the value of heat as a germicide have become greater. He can prepare all the needed materials necessary for conducting an aseptic operation and securing primary healing of the wound at slight expense to himself, and, provided there are some clean vessels and an abundant supply of boiled water, he can look forward to antiseptic results even when surroundings are most unfavorable."

Europhen.—O. Peterson, of St. Petersburg, $\frac{586}{\text{No. 2}}\ \frac{292}{\text{Mar.}}$ tried europhen in 25 cases of circumcision, 20 of soft chancres, 7 hard chancres, 3 ulcerating gummata, 2 buboes, 2 "follicular ulcers," and 1 whitlow. The results were, on the whole, very satisfactory. In cases of circumcision, the wounds, after the insertion of sutures, were freely powdered with the drug and covered with sterilized gauze, cotton-wool, etc., the dressing being changed every one or two days. In 22 out of the 25 cases the wounds rapidly healed *per primam*. In the other 3 they reopened, and that in 2 in consequence of violent erections, while in 1 the gaping seemed to occur in connection with a supervening attack of influenza. In cases of soft chancres, the ulcers, after cleansing with a piece of hygroscopic cotton-wool, were powdered with europhen from one to five times daily. In 1 case, where the application had been preceded by scraping out the ulcers, the latter healed in five days. Of the remaining 19, in 1 cicatrization ensued in three weeks, but in the other 18 it took place in from twelve to fifteen days. Hard chancres, gummata, and whitlow similarly healed fairly quickly. The cases of buboes were treated by incision and scraping out, with subsequent powdering with europhen and application of a pressing bandage. On the removal of the latter, on the seventh or ninth day, the wounds were found soundly united (though in one of the cases dermatitis of the surrounding skin was observed). Peterson comes to the conclusion that europhen offers a useful substitute for iodoform in minor surgery and in the treatment of venereal ulcers. The odor is actually very faint, and, in addition, can be totally disguised by the patient carrying

about in his pocket a handkerchief perfumed with some essential oil of lilac.

In the discussion following the reading of the paper, I. A. Maieff related Iakimovitch's recent clinical parallel experiments with europhen and iodoform, according to which the former decidedly affords the best dressing-material after iodoform. Eroff, while confirming that europhen possesses an excellent antiseptic action, has pointed out that a prolonged application of the remedy may give rise to irritation of the surrounding skin.

In the opinion of P. G. Becker, of New York, $\frac{1}{\text{June 4}}$ europhen is as effective as iodoform. It is lighter in weight, free from disagreeable odor, does not cake, and is more readily dusted or insufflated. In no case in his practice have poisonous results followed its application.

Dermatol.—Stierlin $\frac{214}{\text{No.7}}$; $\frac{26}{\text{July}}$ summarizes as follows the results of his experience with subgallate of bismuth, or dermatol: 1. It is perfectly free from any toxic properties. 2. It never gives rise to eczema or any other signs of local cutaneous irritation, such as are frequently caused by iodoform. On the contrary, powdering with dermatol affords the best means for speedily curing the iodoform exanthemata. 3. It powerfully absorbs wound secretions, and forms a very hard, dense, and closely-adherent crust. Hence it proves exceedingly useful in all cases where astringents and drying are desirable. Thus, its application is followed by excellent results in cases of small-sized, irregular, more or less shallow, non-septic wounds (for instance, crushed or lacerated ones from machinery accidents), or in surgical wounds, such as after the evulsion of ingrowing nails, enucleation of atheroma, etc. It likewise acts beneficially in cases of burns and scalds of the second degree. The blisters should be opened, the raw surface thickly powdered with dermatol, and the dressing left undisturbed for from eight to ten days. 4. Should cotton-wool constitute a part of dressing, it must not be placed directly over the dermatol layer. It is advisable to cover the latter first with a piece of sublimate gauze, since otherwise the wool may blend with the dermatol crust in such manner that the removal of the dressing will prove extremely painful for the patient and very difficult for the practitioner. 5. It should never be used in cases of infectious suppurating wounds (whitlows, furuncles, etc.), since its application can lead to dangerous reten-

tion and accumulation of pus under the dermatol crust. 6. It is of great service in cases of large crural ulcers, as well as in those of very moist eczema and intertrigo. In the latter affection, however, dermatol has a serious rival in ichthyol. 7. In tuberculous ulcers and fistulæ dermatol is absolutely inferior to iodoform. The former does not possess the antitubercular action of the latter. 8. Antiseptic properties of dermatol are weak. It is very likely that its whole antisepticism is limited to drying tissues, and thus depriving bacteria of suitable medium for their development.

A. Schmitt [184 Mar.15] and Schtschegolew [696 Oct.,Nov.] also accord dermatol but insignificant antiseptic properties, and believe that it can in no way claim comparison with iodoform in this particular.

A. K. Stone, of Boston, [99 Sept.] in a series of careful bacteriological and clinical investigations, concludes that dermatol, from its astringent properties in checking secretion,—also its odorless, non-irritating, non-poisonous properties,—has proved itself to be a valuable addition to the surgeon's armamentarium. Laboratory experiments showed that, in addition to its mechanical power of repelling water, thus producing a food famine and consequent death of many of the bacteria, it has active powers in hindering bacteria growth, although it does not have bactericidal action. The method by which this hindrance is accomplished is probably due to its chemical combination with the ptomaines produced by the growth of the bacteria, forming compounds hostile to their rapid development.

Iodoform Intoxication.—Dreesmann, of Bonn, [761 v.9,p.233] reports three cases of iodoform intoxication. In the first case the drug was repeatedly administered hypodermatically in oil (20-per-cent. solution), in a case of white swelling of the knee. Marked neurotic symptoms followed, and the urgency of the case led the surgeon (Trendelenberg) to resect the knee. In the course of the operation a hard mass of iodoform, the size of a cherry, was found just above the condyles. The removal of this sufficed to do away entirely with the neurosis. The second case was also due to injections. Insanity supervened, requiring his transportation for a time to an asylum. The third case also became insane, and died shortly after. These untoward results were ascribed to idiosyncrasy.

Iodine Trichloride.—Belfield [151 Aug.] writes on the use of this com-

pound (ICl_3) in surgery. It is made by passing chlorine-gas over iodine. The result is a reddish crystalline substance emitting an odor of chlorine. It dissolves in its own weight of distilled water, and almost as readily in alcohol. During the past six months he used the trichloride,—at first occasionally, later continually. The cases may be summarized as follows: 1. Two of bladder tuberculosis (diagnosis confirmed in one case by presence of the bacilli, in the other by the discovery of a distinct ulcer); two of epididymis tuberculosis with fistulæ (the latter rapidly closing under hypodermatic injections, for the first time in years); one of tubercular abscess of prostate; six of suppurating tuberculous cervical glands; two of tuberculosis of knee-joint in children; one of tubercular empyema. 2. A miscellaneous line of suppuration cases, including infected wounds, abscesses, and malignant ulcerations. 3. Six cases of ammoniacal cystitis, caused by retention from prostatic enlargement. 4. Venereal sores.

The results may be summarized in the statement that, in a reasonably extended experience and observation, he has never seen tuberculous processes so rapidly subdued by iodoform, nor suppuration by hydrogen peroxide, iodoform, or any other agent. Belfield employed it in the following forms: For hypodermatic use, $\frac{1}{10}$- to $\frac{1}{2}$-per-cent. solution in distilled water alone, or water 4 parts, glycerin 1 part. (In experiments on animals, sloughing followed the hypodermatic use of a 2-per-cent. solution.) For instillation of deep urethra and irrigation of the bladder, and for injection into serous cavities, the same solutions. For suppurating wounds, irrigation with 1- to 5-per-cent. solution in water, either alone or with glycerin. For putrid surfaces (cancerous), venereal sores, etc., 5- to 20-per-cent. solution in equal parts of water, glycerin, and alcohol. Solutions stronger than 5 per cent. usually caused decided smarting in ordinary wounds. The crystals are caustic to denuded surfaces. Gauze sterilized by boiling, immersed in 1- to 10-per-cent. aqueous solution and dried, retains the compound for an indefinite time.

C. R. Illingworth[673 Jan.] uses the sodic-iodide solution of mercury biniodide (1–2000) for all amputation-flaps and recent wounds. He finds union secured more firmly and rapidly than with carbolic-acid dressings, and attributes the firm and rapid union to the solution and removal of the two layers of effused fibrin, on the flat

surfaces, by the fibrin-solvent sodic-iodide vehicle for the antiseptic agent. It has the advantage of being non-irritant, and it is rapidly eliminated by the kidneys. There is, hence, no risk of mercurial poisoning, whether it be employed for medical, surgical, or obstetric purposes.

Diaphtherin.—Klecki [520 No. 34] has examined the comparative antiseptic action of various drugs on the staphylococcus aureus, and has found that the vitality of the microbe is destroyed by a 1-per-cent. solution of carbolic acid, creolin, and thymol; a 3-per-cent. solution of aseptol; a 0.3-per-cent. solution of boric and salicylic acid; a 5-per-mille solution of salicylic acid and of lysol; and a 2-per-mille solution of diaphtherin. The author warmly recommends diaphtherin as a most valuable antiseptic agent, which possesses the great advantage of never causing any exanthemata and being altogether free from any toxic properties. (C. Szadek, corresponding editor, Kiew, Russia.)

Microcidine.—Mabboux [760 July 16] defines the qualities necessary for a good antiseptic, especially if it is to be used in the natural cavities of the body, as follows: (1) a considerable antiseptic power; (2) very feeble toxic qualities; (3) free solubility in water; (4) complete absence of caustic effect; (5) non-action on instruments, linen, etc.

Microcidine, as an antiseptic in urinary troubles, is recommended as covering all the above conditions satisfactorily.

Balsam of Peru.—H. C. Wyman, of Detroit, [71 July] uses the balsam of Peru in the treatment of all open wounds. A compound fracture is treated by pouring the balsam freely into the wounds. Compound fractures of the hand and fingers, so common among railroad injuries, have given the best results when they have been treated freely with the balsam, covered with gauze, and wrapped in cotton.

In diphtheria he found it the best agent to apply to the exudate for the purpose of disinfecting and sterilizing it. Children tolerate it, owing to its pleasant taste. It is powerful as a destroyer of diphtheritic membrane, which appears on tonsils and fauces, and may be applied by means of a swab of soft cotton soaked in the solution.

Milk.—Dale [14 No. 44; 53 July 2] has obtained excellent results in dressing burns with milk. Compresses are soaked with milk and laid on the

burn, to be renewed night and morning. An extensive burn of the leg was healed in this manner. In two days it was reduced in size from 14 to 7 centimetres; at the end of three days it measured but $2\frac{1}{2}$ centimetres in diameter. Another burn, which had been treated for eight days with olive-oil and the oxide of zinc, healed rapidly under a milk dressing.

Antiseptic Mixture.—On the ground of experiments made at Pasteur's laboratory, de Christmas [84 No.26; 101 Aug.] finds that the following mixture possesses very effective germicidal powers: acid carbolic, 9.0; acid salicylic, 1.0; acid lactic, 2.0; menthol, 0.1. The three acids are heated until they become fluid, and then mixed. This mixture is very soluble in glycerin and in water to the extent of 4 per cent. Its germicidal power is said to be greater than that of carbolic or salicylic acids.

Cold.—According to Buch's [19 July 23] experiences, the procedure suggested some time ago by Winternitz is far too little known, and even to a less extent adopted. It consists in a method of cooling the affected limb without necessitating the removal of either dressing or plaster-of-Paris bandage, and is especially applicable when the injury is in the lower half of the extremity.

Winternitz's experiments have conclusively demonstrated that if the upper part of an extremity be surrounded with ice the blood-vessels of the entire limb contract. Winternitz explains this effect by a direct action on the vessels and upon the nerve-branches. Buch, however, ascribes the result to a reflex action, for it frequently suffices to place a single piece of ice upon any portion of the upper part of the arm to affect the temperature of the entire arm several degrees.

Winternitz did not fail to recognize the practical value of his discovery, and invariably used ice applications as described in connection with the local dressings, and found that by so doing he was able to completely check the inflammation in the parts. The method has not, however, received the attention it deserves. Buch has, where possible, used the central applications of cold in connection with the local, and has obtained thereby far more gratifying results than when only local applications were employed. But in other cases, as has been mentioned, where a permanent or fixed bandage precludes the direct use of cold, the application above the dressing then, of course, is the only one feasible. Buch has

obtained the most brilliant results for the past few years in this way. Since he adopted it, he has been able to keep iodoform dressings in their place which otherwise, on account of the pain they produced, would have had to be removed. As soon as the wound began to be painful, Buch would apply a cold pack, or, if possible, an ice-pack, above the dressing, and found that invariably within a short time the pain would cease, and discovered that by this means he could guide the reaction of the wound at will.

The same holds good for fractures of the extremities. Buch is positive that in many cases the plaster-of-Paris splint was well-endured solely on account of the presence of the cold above the wound. During the preparation of the splint he applied extremely cold applications to the entire limb in order to reduce the temperature of the parts as much as possible, and as soon as the bandage has been applied, continues these applications above the bandage. In any case, as soon as the plaster splint causes pain, he applies an ice-pack above the splint, whereby he has always been able to control the pain and, in connection with an elevated position of the limb, also prevent the dangerous swelling so often seen.

Buch also lays stress upon the technique of this method, and agrees with Winternitz that wet cold is much more efficient than dry cold. Therefore, if the ice-bag is used, it should not be placed dry upon the skin, but laid upon a wet compress.

Pasta Cerata.—C. L. Schleich $\frac{41}{\text{No.98,'91}}$; $\frac{53}{\text{Mar.19}}$ describes a salve consisting of yellow beeswax and water, of a creamy, salve-like consistency, which easily permits the incorporation of various medicines. Iodoform easily mixes with it and becomes entirely deodorized; it has a deodorizing action upon other substances as well. This paste is aseptic, and will keep for months unchanged in closed vessels. Exposed to the air, it dries into a waxy substance and does not decompose; as it contains no fatty substances, it cannot become rancid. The writer used the salve as a protective covering for granulating wounds and ulcers, and to cover approximated portions of skin in wounds; in both cases an aseptic scab was obtained. The paste is applied in a thin layer over the part to be covered, and over this is spread a layer of thin, aseptic gauze; this will be found sufficient if it be pressed up against the wound. A second layer of the salve may be spread over the gauze. In burns it acts excellently; in those of the first and second degree it re-

lieves the pains at once and leaves an agreeable sense of coolness; in those of the third degree the iodoform paste has given the best results. The simple paste is of service in the protection of recent scars and wounds just united, fresh granulations, dry eczemas, and especially as a protective in crural ulcers. Mixed with iodoform, the salve combines the advantages of a simple paste with the specific action of iodoform. It is very handy in syphilitic affections of the penis, vagina, prepuce, and labia, as no complicated dressings are necessary. Schleich has also combined the salve with corrosive sublimate, ichthyol, and dermatol, which combinations he has used with success.

Valuable contributions to the general literature of the subject were made by W. H. Wathen, of Louisville, Ky. $^{1}_{\text{Nov.14,'91}}$; F. A. Maljean, of the French army $^{243}_{\text{Dec.,'91}}$; F. C. Husson, of New York $^{101}_{\text{Dec.,'91}}$; W. Alexander, of Liverpool $^{187}_{\text{Jan.}}$; R. O'Callaghan, of Carlow, Ireland $^{16}_{\text{Dec.,'91}}$; George C. Stemen, of Fort Wayne, Ind. $^{756}_{\text{Jan.}}$; S. Bonnet, of Paris $^{24}_{\text{Feb.21}}$; W. G. Macpherson $^{2}_{\text{Feb.27}}$; A. Dührssen, of Berlin $^{236}_{\text{Apr.}}$; C. H. Richardson, of Montezuma, Ga. $^{117}_{\text{May}}$; J. P. Mann, of Philadelphia $^{80}_{\text{May}}$; D. T. Gilliam, of Columbus, O. $^{1003}_{\text{June}}$; Sir Spencer Wells, of London $^{2}_{\text{June 4}}$; George W. Miel, of Denver, Col. $^{155}_{\text{June}}$; I. J. Prouty, of Keene, N. H. $^{99}_{\text{Sept.1}}$; T. H. Manley, of New York $^{760}_{\text{June 25}}$; O. J. Price, of Chicago $^{756}_{\text{June}}$; Emmet L. Smith, of New York $^{128}_{\text{July}}$; James E. Moore, of Minneapolis $^{105}_{\text{July 15}}$; F. J. Thornbury, of Cincinnati $^{760}_{\text{July 23}}$; $^{61}_{\text{Aug.20}}$; $^{170}_{\text{Sept.}}$; A. H. Cordier, of Kansas City $^{61}_{\text{July 9}}$; M. Dominguez Adame $^{634}_{\text{Aug.31}}$; A. W. McAllister, of Columbia, Mo. $^{72}_{\text{Sept.}}$; C. H. Merz. $^{202}_{\text{Sept.26}}$

SURGICAL DRESSINGS, ETC.

Elastic Constriction.—Sokolovski, of St. Petersburg, $^{6}_{\text{Mar.12}}$ has recently performed a large number of experiments for the purpose of ascertaining whether, after the use of such contrivances as Esmarch's bandage, the healing of wounds is at all altered or retarded. His plan was to make similar incisions or other wounds on the two hind legs of a dog or a rabbit. One of the limbs had been rendered bloodless by an elastic bandage, while the other was operated on without this precaution. Both wounds were dressed, and their subsequent progress compared both by ordinary and by microscopic observations. The regeneration of epithelial elements is brought about by the multiplication of the cells of the formative layer by indirect or partially direct division. Sometimes the wound

becomes covered with an epithelial growth, which is inefficient, not being permanent, but undergoing degeneration. Generally, the cells of the old epithelium at the edges of the wound undergo changes, consisting in a diminished amount of chromatin, in consequence of which the nuclei are bright and stain badly, or the chromatin fibres become diminished in number, but are shorter and thicker; these changes do not, however, go as far as chromatolysis. Mitoses of the epithelial cells are mostly seen when the wound is covered with one or two layers of cells; sometimes, however, they occur in the cells of old epithelium lying in close vicinity to new cells. All the above processes take place in wounds, whether they have been inflicted on a bloodless limb or on one in its ordinary condition; but in the former case there is a marked retardation. If the bloodless condition of the part has not lasted more than three hours, the alteration in the cells is but slight, and confined to the superficial layer. When, however, it has persisted for a longer period, the cells of all the layers are affected, the nuclei becoming stellate, staining badly, appearing too bright, and having a deficiency of chromatin. The mitoses are diminished in a wound made in a bloodless part, and some of the karyokinetic figures are abnormal, the rays of the asters being irregular or shortened and thickened.

N. Senn, of Chicago, [451 Aug.] formulates his views on elastic constriction as a hæmostatic agent in the following conclusions: 1. The use of the elastic bandage to secure a bloodless condition of a limb should be discarded, as compression of the parts affected may produce mechanically dissemination of malignant tumors and microbic diseases. 2. A bloodless condition should be secured by elevation of the limb prior to constriction. 3. Constriction should be made with sufficient force to interrupt at once both the arterial and venous circulation. 4. Venous stasis should be prevented by constricting quickly, beginning pressure on the side of the limb supplied with the principal blood-vessels. 5. Linear or too firm constrictions should be avoided, as they are liable to give rise to muscular injury and temporary or permanent paralysis due to harmful compression of a large nerve-trunk. 6. Elastic constriction of a limb for hæmostatic purposes should be diffused over an annular space not less than two inches in width, and can be made with least danger of injuring important structures by an elastic

band made for this purpose or an ordinary elastic bandage. 7. Circular constriction of a limb should be made, if possible, at a point where the large nerve-trunks are well protected by overlying muscles, and if this cannot be done on account of the site of operation, a thick compress of gauze should be interposed between the constrictor and the limb. 8. The vitality of the tissues, when excluded from the circulation, is endangered by prolonging the ischæmic condition for three or four hours, and gangrene may take place if constriction is continued for a longer time. 9. The process of karyokinesis in tissues temporarily deprived of circulation by elastic constriction is unfavorably affected if constriction is continued for more than two hours.

Catgut.—D. Braden Kyle, of Philadelphia, $^{80}_{May}$ studied the effect of immersion in aqueous and alcoholic solutions on tensile strength of catgut ligatures. Two bottles of the prepared gut were selected. In one the gut was preserved in sublimated alcohol, and in the other in juniper-oil. Each bottle contained three sizes of the gut, —No. 1 being the smallest, No. 2 medium, and No. 3 the largest size. The length of time of immersion in each case in the different solutions varied from twenty to forty minutes, or the time generally consumed in ordinary operations. The length of gut was in each case eight inches,—two inches for fastening, and six inches for traction. The number of pounds required to overcome the resistance offered by the catgut was indicated by a graduated scale, care being taken to make traction in the direct line with the scale. The traction was a steady pull, the length of time before breaking being indicated by means of a stop-watch. No doubt some variation in the textile strength of the gut was due to inequality in the size of the gut used. In fact, this was proved by several comparative tests.

The experiments showed that all aqueous solutions incline to greatly diminish the strength of gut, and that, the longer the immersion, the greater the diminution in strength. The result from immersion in boiled water showed the greatest diminution. In pure alcohol an increase in strength was observed in direct ratio with the time of exposure. Alcohol and carbolic-acid solution had very little effect. After twenty to forty minutes the strength was somewhat lessened. It was found that the catgut taken from the juniper-oil, when subjected to the different solu-

tions, showed better results than did that taken from the sublimate solution. All sublimated solutions were found to lessen the strength of the catgut.

The following table shows the result of experiments:—

	Minutes of Time the Catgut was Exposed.	Sublimated Alcohol. Amount of Traction in Pounds.			Sublimated Alcohol. Time of Breaking, in Fractions of a Minute.			Juniper Oil. Amount of Traction in Pounds.			Juniper Oil. Time of Breaking, in Fractions of a Minute.		
Size of catgut used	..	1	2	3	1	2	3	1	2	3	1	2	3
Prepared catgut	..	$3\frac{1}{4}$	$8\frac{1}{2}$	16	$\frac{1}{4}$	$\frac{3}{4}$	$\frac{4}{5}$	$3\frac{1}{4}$	12	$21\frac{1}{2}$	$\frac{3}{4}$	$\frac{1}{2}$	$\frac{1}{2}$
Solutions used. Pure alcohol	20	$4\frac{3}{4}$	$6\frac{5}{8}$	17	$\frac{1}{5}$	$\frac{3}{6}$	$\frac{1}{3}$	$4\frac{1}{2}$	$13\frac{1}{2}$	$25\frac{1}{2}$	$\frac{1}{4}$	$\frac{1}{2}$	$\frac{1}{2}$
	40	5	$7\frac{1}{2}$	$17\frac{3}{4}$	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{3}{4}$	5	14	26	$\frac{1}{5}$	$\frac{1}{3}$	1 m.
Alcohol and carbolic (1 to 40) acid, equal parts.	20	$4\frac{1}{2}$	$8\frac{1}{2}$	19	$\frac{1}{3}$	$\frac{1}{4}$	$\frac{3}{4}$	$3\frac{1}{2}$	$12\frac{3}{4}$	21	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{1}{2}$
	40	$5\frac{3}{4}$	$6\frac{1}{2}$	14	$\frac{1}{4}$	$\frac{1}{6}$	$\frac{1}{4}$	2	$11\frac{1}{2}$	20	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{1}{4}$
Corrosive sublimate and alcohol, equal parts	20	..	..	..	..	..	..	$2\frac{3}{4}$	$9\frac{1}{2}$	16	$\frac{1}{8}$	$\frac{1}{2}$	$\frac{1}{2}$
	40	..	..	..	..	..	..	$3\frac{1}{4}$	8	$14\frac{1}{2}$	$\frac{1}{6}$	$\frac{1}{3}$	$\frac{3}{4}$
Corrosive sublimate (1 to 1000), aq. sol.	20	..	..	..	..	..	..	$2\frac{1}{8}$	$8\frac{1}{2}$	$12\frac{1}{2}$	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{4}$
	40	..	..	..	..	..	..	$1\frac{7}{8}$	$7\frac{1}{4}$	11	$\frac{1}{6}$	$\frac{1}{3}$	$\frac{1}{2}$
Boiled water	20	2	$6\frac{1}{2}$	13	$\frac{1}{5}$	$\frac{1}{3}$	$\frac{3}{4}$	$2\frac{1}{3}$	$6\frac{7}{8}$	13	$\frac{1}{6}$	$\frac{1}{3}$	$\frac{1}{2}$
	40	$2\frac{1}{3}$	$5\frac{3}{8}$	$11\frac{3}{4}$	$\frac{1}{5}$	$\frac{1}{3}$	$\frac{1}{2}$	2	6	12	$\frac{1}{6}$	$\frac{1}{4}$	$\frac{2}{3}$

Silk-Worm Gut as a Ligature.—Guermonprez [26 Aug.] compares this substance with wire as a ligatant, for it is as incapable of absorbing septic matter, almost as strong, quite as smooth, and nearly as flexible. Its disadvantages are a tendency to spontaneous fissure and of cracking if bent too sharply, as in making a knot. But there is none which the living tissues tolerate more perfectly; it may not be absorbed, but it is never thrown off. For suturing the stomach, the intestines, the bladder, it is unsurpassed, and in the operations of tenorrhaphy, staphylorrhaphy, and for closing vesical fistulæ it should always be preferred.

Preparation of Catgut for Ligatures.—W. Goodell [80 Jan. 15] prepares his catgut ligatures as follows: The unprepared gut comes in greasy coils, of a dark-amber color. To dissolve out the fat, these are placed in commercial ether for from twenty-four to forty-eight hours, according to the size of the gut; and, if the gut is of the larger sizes, the ether is changed once. The gut is now immersed for forty-eight hours in a 1-to-1000 alcoholic solution of corrosive sublimate. It is then wound on glass spools by surgically-clean hands, and kept permanently for use in a mixture of 2 parts of oil of juniper to 1 part of alcohol, which is occasionally changed. When needed for an operation, the requisite number of spools are transferred to a mixture of 1 part of glycerin,

which has been sterilized by heat, to 9 parts of alcohol. This gives the gut greater smoothness and pliability. Thus prepared, it will last in the tissues of the body from a week to ten days.

Sterilization of Catgut.—G. R. Fowler, of Brooklyn, [157 Mar.] recommends a method for the sterilization of catgut, which he has since employed with the greatest possible satisfaction, namely, that of boiling the gut for one hour, under pressure, in 97-per-cent. alcohol. Gut thus prepared, even though it be infected by anthrax itself, after such boiling becomes absolutely sterile, and repeated efforts to make cultures therefrom fail. Alcohol under pressure can be heated to 200° F. (93.3° C.), by means of an ordinary water-bath, in a tightly-sealed fruit-jar. In addition to the influence exerted by the alcohol and heat combined, it is probable that the element of pressure is to be taken into account in estimating the value of this method of sterilization

Bandages.—M. H. Farmer, of Decatur, [1 June 25] describes a scheme for bandage-cutting that will be of practical utility to the surgeon who desires to roll his own bandages. He purchases a bolt of muslin and takes it to a printing-office where they have a paper-cutter; in five minutes the entire bolt can be cut into bandages of different widths, and afterward rolled in lengths to suit. This gives a nice even bandage, and is in every way superior to those torn or cut with scissors.

A combined dressing and bandage for emergencies has been devised by Kölliker, of Leipzig. [336 No.27; 26 Sept.] The first part of the roller consists of 20-per-cent. iodoform gauze. This is followed by a sterilized bandage. The whole measures five metres by eight centimetres, and weighs, plus the safety-pin, supplied with the bandage, fifteen grammes. The bandages are put up in air- and water-tight packages. Other antiseptics can be used instead of iodoform.

Baelde [220 Sept.16] reports a dangerous falsification of iodoform gauze. Instead of 30 per cent. he found but 8 per cent. of iodoform, the deficient coloring having been made up by means of picric acid. This may, however, be readily detected by dipping a piece of gauze in water; picric acid will at once color it yellow, while iodoform will not.

Sterilization of Rubber Instruments.—Lannelongue [112 Mar.] recommends, for the sterilizing of hard- and soft- rubber instruments, subjecting them to the fumes of quicksilver. The instruments are

rolled in flannel impregnated with mercury and placed in closed vessels. The space becomes filled with the fumes of the quicksilver. The bacteriological examinations show that after a very short time the instruments are thoroughly antiseptic. As a lubricant the author is in the habit of using olive-oil; a few globules of the quicksilver are kept on the bottom to keep the oil sterile. Since these measures have been adopted the author has had the best results.

The Protective.—D. Benjamin, of Camden, [121 Dec.] states that the "protective" should not be used in antiseptic surgery; instead of keeping the edges of the wound together, its tendency is to prevent the escape of effusions, causing pressure and separation of the edges of the wound.

INSTRUMENTS.

Drainage Tubes.—Haydn Brown [6 Mar.19] describes a new form of glass drainage-tubes, of such soft consistence that they will readily admit of being bent into any shape required merely by the aid of an ordinary spirit-lamp or Bunsen burner. The tube, being held in the flame until well heated, is easily manipulated into the desired shape; it will rapidly cool. Being absolutely smooth throughout, and having a gently-beveled distal end, any irritation, whether that of insertion, removal, or *in situ*, is reduced to a minimum, and excretion is rendered much more expeditious. Granulations are also not so liable to be injured as they are by the India-rubber tubes, which have less perforations than those under notice. Ever remaining patent, they collect the discharge from all parts.

Sponges.—Rettenheimer [581 Dec.17,'91; 80 Mar.] states that iodoform sponges may be prepared in the following manner: Suitable soft sponges are thoroughly boiled in water, then allowed to remain for five days in a 5-per-cent. solution of hydrochloric acid, and at the end of that time thoroughly washed in pure water to remove all acid, and finally dried. They are then placed in a 7.5-per-cent. ethereal solution of iodoform, and allowed to remain there until the ether evaporates.

Substitute for Sponges.—Beall [85 Dec.,'91] regards the Loofah dish-cloth, or inside of the vegetable dish-rag gourd, as an excellent means of cleaning any surface upon which the knife is to be used. It is cheap, will not irritate the skin, will bear any kind of anti-

septic solutions or soaps, and will rapidly remove dirt and infectious material.

Sponge-Holder.—S. Leigh, of Norfolk, Va., $^{1}_{\text{Mar.26}}$ devised a sponge-holder calculated to hold the sponge very firmly, while presenting a convenient shape, especially for abdominal surgery purposes. The instrument consists of two long rods, with serrated grasping-tips securely held together by an aseptic lock.

Hypodermatic Syringe.—An antiseptic hypodermatic syringe with lubricating piston is described by J. B. White, of New York. $^{245}_{\text{Mar.}}$ The most striking peculiarity about the instrument consists in its having two chambers or barrels, arranged and adapted in capacity to each other so that the fluid drawn up into the syringe proper, for hypodermatic use, does not enter the suction-barrel or come in contact with the piston and become liable to contamination.

Suture-Case.—G. R. Fuller, of Brooklyn, $^{1}_{\text{Dec.12}}$ described an aseptic suture-case. The instrument looks like a test-tube with a rubber stopper and a threaded nipple projecting from its side, the latter being furnished with a metal cap. A glass reel for the suture, the end of the latter being held in the grasp of the nipple-cap, completes the instrument, which, when closed, can be submitted to sterilization processes.

Needle-Holders.—S. Leigh, of Norfolk, $^{1}_{\text{Mar.26}}$ devised a needle-holder; on the face of its circular jaws are radiating slits. The needles can thus be held in any direction. Leverage is so utilized as to give the instrument great firmness. A sliding-catch makes the manipulation easy. G. Willis, of Greenville, Cal., $^{1}_{\text{Jan.9}}$ also presented a needle-holder, devised to carry the ordinary surgical needle, Hagedorn's needle, and Thiersch's spindles for ligature *en masse.* The holder consists of four very strong and simple parts: 1. A hollow tube with a distal plate. 2. A central stem. 3. A spiral spring. 4. A proximal (or heel) plate. The spring forms the grip or handle; the proximal plate screws on to the central stem, has a milled edge, and compresses the spiral spring, which, in turn, compresses the stem and tube. By turning the proximal plate the needle-grip is rendered invincible. When this heel-plate is unscrewed, the four portions of the instrument drop apart. Release of the needles is effected by compression of the spring, one hand only being required.

Double Suture Needle.—M. J. Kenny, of London, $\frac{2}{\text{June 11}}$ devised a double suture needle, in tortoise-shell handle, suitable for a pocket-case. One needle is hollow, for the application of wire sutures; the other has the eye at the point, for use with carbolized gut or silk.

Scissors for the Removal of Sutures.—John A. Prince, of Springfield, Ill., $\frac{1}{\text{Apr. 30}}$ states that there exists no instrument whereby the removal of ordinary and especially of fine coaptation sutures may be done easily and without pain and annoyance to the patient, who usually dreads the removal of the sutures almost as much as the original operation, and with reason. In the removal of a suture it is, of course, necessary to cut the loop, and, to facilitate the entrance of the point of the scissors for this purpose, more or less tension is put upon it, thus causing pain. Some time ago he began to use Stevens's tenotomy scissors for this purpose, and was surprised to find how easily and painlessly a suture could be removed. Deriving his idea from this instrument, he devised scissors the cutting-edge of which is limited to the tapering extremity of three-eighths of an inch. These scissors are made very strong, and are capable of cutting heavy silk or silver wire, yet they possess a cutting-point as fine as the most delicate eye-scissors. Hence, in the removal of a suture by them, the slightest degree of tension is necessary, and the minimum of pain is felt.

A Pocket Plaster-Knife.—J. Ridlon, of Chicago, $\frac{61}{\text{Aug. 13}}$ constructed an instrument of this kind. The large blade is a short, pruning blade, of extra thickness in the shank and thin at the point, for use in cutting down plaster corsets and such splints as the surgeon may desire to preserve in perfect shape. The pen-blade is for use when it is desired to preserve the jacket or splint. Being entered obliquely, layer by layer of the plaster bandage rises as it is cut through, all troublesome wedging of the knife is avoided, and the chances of wounding the patient are lessened. The third blade is a nail-file with Curley's patent burnisher.

Safety-Pin for Holding Drainage-Tubes in Place.—Joseph L. Hancock, of Chicago, $\frac{779}{\text{Apr.}}$ contributed a device for holding soft drainage-tubes in place. It is a surgical safety-pin, constructed of one piece of nickel-plated steel wire, turned into a circular form once and a half around. Then a sudden bend is made and the end carried straight across the middle to the opposite side, where

the point rests upon the wire. The other end of the curved wire is turned up into a small hook to receive the point, for holding and giving firmness to the springing frame, which is so made to facilitate the catching and unlocking of the pin.

ANÆSTHETICS.

By DUDLEY BUXTON, M.D., B.S.Lond.,
LONDON.

DEATHS UNDER ANÆSTHETICS.

A NUMBER of such fatalities have been reported, and some attempt has been made to arrive at reliable statistics, both as to the number of deaths under chloroform and the symptoms occurring. Gurlt, of Berlin, [336 Aug.13] offered, before the Twenty-first German Surgical Congress, some valuable statistics. With 94,123 administrations, there were 36 deaths,—*i.e.*, 1 in 2614. The cases observed [226 '91] during six months, in the practice of sixty-six surgeons, gave 22,656 inhalations with 6 deaths, and 71 instances in which asphyxial symptoms of a grave character supervened. This gives 1 death in 3776 cases, and 1 asphyxial (severe) in every 319 cases. Richardson [38 Jan.] gives the mortality in England for twenty-one years (1848–1869) as 11 deaths in 35,162, or 1 in 3196, but he regards the average mortality as 1 in 2500. For ether the same authority gives 8431 inhalations, 1 death; for ether mixed with chloroform, 1 death in 2891 cases; for pental, 1 in 215. In 1055 cases of chloroform and ether, 5 cases of severe asphyxial symptoms arose, and 4 in 417 of the A. C. E. mixture. These statistics will probably require emendation when the *Lancet* inquiry, which is in course of serial issue as we go to press, is in the hands of the profession.

CHLOROFORM.

In the course of a discussion upon the question, "Can any measures be adopted to prevent deaths from chloroform?" Lowndes, of Liverpool, [187 Nov., '91] insisted (1) that only a duly qualified man be allowed to administer; (2) that only specially-pure chloroform be used; (3) that a continuous small-percentage atmosphere of chloroform be given: (4) that previous inquiry be made as to whether the patient has an idiosyncrasy to chloroform; (5) that due preparation for and assurance of the patient be made.

Raul traced chloroform deaths to: 1. Throat asphyxia, arising from reflex paralysis of the tongue and neighboring parts, or the presence of mucus, blood, or vomit. 2. Chest asphyxia, in which the respiratory muscles are in a condition of tonic spasm, brought on during the stage of excitement. 3. Paralysis of the respiratory or cardiac nervous apparatus, due to (*a*) an excess of the anæsthetic; (*b*) the anæsthetic with previous exhaustion of the centres by partial asphyxia; (*c*) the anæsthetic with depression from disease, operation, fear, or idiosyncrasy. 4. Heart-failure, which, when it occurs in the early stage of the administration, is due to a peculiarity of the patient, and not, as a rule, to the method of giving the chloroform. Greater care and watchfulness on the part of the chloroformist, and the restriction of its use to those familiar with its employment, will, this writer thinks, tend to lessen the mortality.

Richardson's views upon the causes of death under chloroform may be summarized as follows [38 Jan.]: 1. The mental or physical condition of the patient is, with the one exception of dilatation of the right heart with general venous engorgement, evidenced by a varicose condition of the veins, not responsible for death, and gives no reliable warning of possible danger. 2. The condition of the surrounding air as a cause of danger is of great importance. When the air is surcharged with moisture the chloroform condensation in the pulmonary air-cells and its subsequent entrance into the blood are impeded; the stages of narcotism will, by this, be prolonged. Recovery is also slower. Syncopal attacks in a moist atmosphere are more likely to terminate fatally. Again, the moisture which should escape from the air-passages cannot do so when the atmosphere is too saturated, and the tendency to water-logging of the lungs under chloroform is increased.

Temperature.—When high, the volatilization is more rapid, its diffusion and condensation are increased, and both the onset and the recovery are more rapid. The safest temperature is 60° to 70° F. (15.6° to 21.1° C.); a high rather than a low range is preferable.

Mode of Administration.—Richardson holds the theory that a given percentage (below 5) of chloroform is always safe. Narcotism, he affirms, is throwing certain systems of the body into a lethal state, and systemic death is escaped or follows according as the vital centres, still capable of involuntary organic work, are or are not sound. Upon the subject of rapid induction of anæsthesia

Richardson says that fatal results follow upon the sudden impact of chloroform—an irritant vapor—upon the nervous periphery of the breathing-surfaces. He contends that sudden deaths occurring at the commencement of chloroformization are due to this cause, and not to fright. Further, this sudden impact causes a contraction of the pulmonary arterial vessels; thence results ischæmia of the lungs and overfilling of the right heart, leading to cardiac standstill. These facts, he insists, point to the *extreme danger of rapid chloroformization.* A few minims of chloroform injected into a vein kills the heart-muscle outright and beyond recovery. If the animal is healthy the lungs prevent such a catastrophe when the chloroform is inhaled, but Richardson contends that when the heart is not healthy the lethal dose may be so small that it may pass through the lungs and reach the heart, causing fatal syncope. While gradual, rather than rapid, chloroformization (two minutes for infants, three for children, and four or five for adults—Snow) is recommended, the danger is urged of overcaution, as the blood grows highly saturated with chloroform before anæsthesia is obtained, and the organs and tissues are so saturated with chloroform that, should any casual accident arise, it is fatal in spite of all efforts to withdraw the chloroform from the blood, since re-absorption into the blood takes place from the tissues.

The writer formulates this rule: "Never induce slow narcosis through every stage, but, having carefully felt the way in the first minute or two, push quickly into the third stage, in which, if the body be not surcharged with chloroform, the danger is comparatively small." Richardson attaches little importance to the impurities of chloroform, except such as can readily be perceived with the nose. Murray-Aynsley $\frac{557}{\text{June,July}}$ publishes a list of recent deaths under chloroform, and points out that a large proportion of these occurred within a very short time after the commencement of inhalation, or when comparatively trifling, although painful, operations were to be performed, extraction of teeth, etc. He regards these deaths as due to *shock* during *imperfect anæsthesia.* He denies that the experiments performed by the second Hyderabad Commission prove that shock under chloroform was not competent to produce syncope, as in them painful operations were performed on animals coming out of chloroform, and in a condition where, as he contends, analgesia persisted, although anæsthesia was imperfect.

The experiments should have been undertaken as the dogs were going under the chloroform, and before its complete action had been obtained. This writer also warns against too prolonged a fast prior to taking chloroform. Mansfelde $^{106}_{\text{Sept.}}$ quotes Petruschky as stating that after death from chloroform there is a decided acid reaction of the fluids and tissues, and, further, that the lessening in alkalinity actually occurs during chloroform inhalation *intra-vitand.* Taken in connection with the researches of Kast and Mester, showing that fatty degeneration follows prolonged inhalation, this possibly explains the lethal effects that chloroform exerts on the cells. The urine, further, has its acidity increased after chloroform. It would appear as if the acid excretions of the working-muscles, etc., usually readily neutralized by the cells (Langendorff), are left unaltered, or are imperfectly neutralized during chloroform inhalation.

Measures to be Adopted in Cases of Chloroform Toxæmia.— Iliffe, $^{2}_{\text{Feb.6}}$ reasoning from MacWilliams's experiments, which showed that the heart becomes dilated and atonic under chloroform inhalation, proposes that, in cases of cardiac failure, the heart-muscle should be grasped and compressed intermittently by pushing the hand backward beneath the xyphoid cartilage. His experience with this method is encouraging.

A somewhat similar method is advocated by König $^{4}_{\text{Mar.21}}$ in two cases of pronounced cardiac failure under chloroform. The following plan of resuscitation was pursued by Maas, and, after over an hour, in each case successfully: The mouth was opened, the tongue drawn forward, and the epiglottis raised. The precordial region was then compressed thirty or forty times a minute (the frequency of respiration). Whenever this was stopped, syncopal symptoms again appeared. Subsequently tracheotomy was performed, as it was difficult to keep the air-passages free; but this did not assist the circulation. The respirations becoming almost imperceptible, Sylvester's method of artificial respiration was adopted, and more vigorous pressure made over the breast. A similar course was adopted in the second case. The manœuvre is thus performed: The operator stands upon the left side of the patient, and presses, with quick, strong movements, deep down in the region of the heart with the fingers of the right hand, while the ball of the thumb is placed above the left clavicle. The number of

compressions is one hundred and twenty or more a minute. The left hand should seize the patient upon the right side of the thorax.

Foy $_{\text{July 2}}^{6}$ advocates the inhalation of oxygen-gas in cases of impending asphyxia under chloroform. The plan of introducing a gentle current of oxygen into a cone from which the anæsthetic was being inhaled was successfully adopted $_{\text{July 23}}^{2}$ in a case of empyema in which there had been an almost fatal result before the use of this method.

The failure of respiration under an anæsthetic may sometimes be overcome and spontaneous respirations initiated by pouring a quantity of ether upon the bared abdomen. The cold thus produced will, says Hare, often prove successful in restarting breathing. Attempts to excite the contraction of the diaphragm by electric stimulation of the phrenic nerve are fraught with danger, for, as Wood has pointed out, the overflow of the current is likely to lead to cardiac inhibition. Wood considers "forced respiration" the most valuable plan. He employs a pair of bellows which are connected with a tracheal tube by India-rubber tubing; a face-mask is also required.

Murray-Aynsley cautions against commencing artificial respiration by an act of *inspiration*,—that is, by dragging the arms above the head,—for such a proceeding serves to promote further absorption into the blood of the chloroform from the saturated air in the lungs. In every case *expiration* should be performed, or, better still, the chloroform-laden air should be sucked out of the lungs.

The value of strychnine as an antidote to chloroform, when given hypodermatically, is insisted upon by many, and the experience of the past few years corroborates its value. The injection, either intra-venous or hypodermatically, of the physiological solution (6 per cent.) of sodium chloride is advocated in chloroform toxæmia by Bobroff. $_{\text{Jan. 9}}^{6}$ He does not wait for complete stoppage of the circulation, and the quantity to be injected depends upon the amount of blood lost during the operation.

Richardson $_{\text{Jan.}}^{38}$ recommends giving alcohol in definite doses twenty minutes before the inhalation. His formula is:—

℞ Tinct. chloroformi, ... ℥j (4 grammes).
Spir. tenuor., ... ℥j (31 grammes).

This may be taken in water, and sweetened if preferred.

Purification of Chloroform.—The perils which were believed to reside in the impurities of chloroform, other than such gross ones as chlorine, hydrochloric acid, phosgene gas, have been somewhat discounted, both as a result of experience and of experiment. The Pictet chloroform is reputed to be absolutely pure by virtue of its process of manufacture. It is crystallized, and the mother-liquor, which presumably contains all the impurities, carefully removed. Réné Dubois-Reymond performed experiments upon lower animals, and stated that the Pictet chloroform gave no bad results, although the residue chloroform (that, namely, from which the crystals had been removed) lowered blood-pressure and caused respiratory failure. The dangerous symptoms familiar under chloroform narcosis showed themselves earlier and with greater severity when the residue was inhaled than when the Pictet chloroform was employed. He meets the objection—that whatever impurities exist, and which are in a concentrated form in the residues, are, in point of fact, so dilute in the ordinary samples of the drug as to be practically of no account—by saying that the impurities, although very slight in amount, possess a peculiarly obnoxious influence upon the human organism when in solution in chloroform.

Upon the other hand, it is stated by some manufacturers that Pictet's chloroform is not any purer than other forms, and that purification by crystallization is an imperfect method (Blitz). In the first twenty-five cases in which Pictet's chloroform was used one death occurred. Schacht found that, notwithstanding the small percentage of alcohol which Pictet's chloroform, like all other brands, contains, it underwent decomposition in precisely the same manner as do all other chloroforms.

To Check Vomiting After Chloroform.—Passel $^{34}_{\text{June 7}}$ asserts that the vomiting is due to swallowing of the vapor, which condenses and irritates the gastric mucous membrane. To obviate it he suggests that the patient be encouraged to expectorate freely during the initial stage, as that is the one during which salivation occurs.

ETHER.

Syncope During Ether Inhalation.—A. C. Wilson $^{6}_{\text{Mar. 12}}$ narrates a somewhat unusual experience in England,—a failure of the heart under ether. The patient was a male, aged 17 years, free from organic disease. The ether was given from a Clover inhaler.

The operation was division of the tendons in enucleation of the eyeball. The syncope occurred one minute after the removal of the ether-inhaler, and just as the operator was dividing the tendons. Inversion and artificial respiration restored the patient to vitality. It is suggested that the operation probably determined the faint. Mills (St. Bartholomew's) drew attention to the peculiar tendency to syncope during tenotomy for strabismus.

Butler $\frac{226}{B.40,p.66}$ gives his experience of five hundred cases of ether narcosis in Dresden. He speaks in praise of its use in ordinary surgery, but finds it contra-indicated in phthisis and for persons afflicted with goitre. He believes there is less sickness or general malaise after ether than after other anæsthetics, and he regards it as much less dangerous than chloroform. There is, however, he believes, a decided lowering of the temperature of the body, which persists even after the inhalation has ceased.

With regard to the rapid breathing often found troublesome in ether narcosis during abdominal surgery, Haig Ferguson believes that it is not due to stimulation of the phrenic nerves, but to paralysis of the nerves which innervate the thoracic respiratory muscles. He suggests no remedy, and it seems at least doubtful whether the explanation is likely to be received when it is remembered that such respiratory acceleration is by no means the rule; nor are the thoracic movements observed to be in abeyance, but rather to be involved in the respiratory storm which sometimes characterizes the earlier stages of ether narcosis in such cases.

The sickness and nausea occasionally following ether are best treated, Brinton asserts, by sp. chlorof., gtt. iv or v, with acet. opii, gtt. ij or iij. He believes also that gr. $\frac{1}{6}$ (0.011 gramme) of morphine, given before the operation, lessens after-sickness. Upon the other hand, there are observers who regard morphine and ether a dangerous combination, especially if there be the least chance of trouble from bronchial hypersecretion.

The experience of five hundred cases by a careful observer is of value; so we give a *précis* of Guest's results, $\frac{224}{Aug.27}$ which are in accord with the general opinions expressed by experts. He regards advanced age as a drawback to ether, from its usual coincidence with bronchial, cardiac, or renal disease. Women, he affirms, possibly from being more temperate, take ether better than men. The short and stout bear it ill, probably from the

mechanical dyspnœa which their obesity causes. The nervous and uneducated take it less well, and suffer more subsequently than the calm and cultured. Telling the patient what to expect, Guest finds, will often banish struggling and alarm. The use of stimulants before the operation is deprecated, as likely to cause overstimulation and wear out the heart, and Rushmore (*v. infra*) agrees in this disapproval of giving whisky before ether. Slow etherization is justly regarded as a danger, as well as a barbarous infliction upon the patient of unnecessary misery. When the patient is well under the influence of the drug, very little additional inhalation is required to maintain anæsthesia, and the less that is given, the less bronchial and mucous secretion there will be. The posture which the author advocates is the dorsal decubitus, but he insists, further, that the head should be actually lower than the body, so that, if the anæsthesia be commenced with the head on a pillow, this last should be withdrawn when unconsciousness supervenes. Lesions of the lungs or kidneys are far more important, he considers, in the ether prognosis than those of the heart, blood-vessels, or brain. The time occupied in etherization is put down as eight minutes, which is certainly far longer than is necessary; but Guest uses an extemporized inhaler, which does not give such rapid anæsthesia as the Clover, Allis, or Ormsby inhaler. The device is ingenious, and, in the absence of a properly-constructed inhaler, may be adopted. It is made by spreading a towel out and placing a pamphlet (or newspaper) at one end, leaving a two-inch margin for a grip over it. Fold each side in over it, and turn the pamphlet once, which lines your cone. Now fold the pamphlet sideways to the long axis of the towel, and the cone is completed, except that the two ends remain open. Bring the long strip of the towel over the sides of the cone for one revolution, and pin when you reach the end of the towel.

The use of morphine preliminary to ether inhalation finds another advocate in Rushmore,[61] Mar. 19 who combines it with atropine and injects it hypodermatically. He believes that it checks after-vomiting, and prefers it to bromides, chloral, or opium, all of which failed, in his hands, to produce good results.

Rushmore makes a suggestion which our own experience also commends; that is, to allow the patient to smell at the ether-bottle or inhale from the inhaler, holding it away from the face

with his own hands. This preliminary step produces anæsthesia of the pharyngeal mucous membrane, and overcomes the feeling of suffocation and inclination to cough which so often mark the initial stage of etherization. Under the head of ether risks, it is justly pointed out that if pneumonia follow ether, as is frequently asserted, the symptoms of that disease should reveal themselves immediately after the inhalation, whereas, in most of the cases reported, the ill effects did not develop until some days after the operation; and, further, there were, in almost all the cases, some other possible cause present at least as likely to be responsible for the lung trouble as the ether. In reference to renal complications under ether, Weir's experience is of value. Out of thirty-four cases in which albumen was not found prior to operation, in nine it existed after, and was transitory, but in twenty-five there was absolutely no change in the urine.

Feutin, of Berne, has further shown that ether exercises no effect upon the healthy kidneys in the lower animals. It is not dangerous to human beings even when slight renal disease exists. Whatever circulatory changes do occur after ether are transitory. He adds that the presence of abnormal urinary ingredients is not an absolute contra-indication to ether. It is justly remarked that very many of the pulmonary or renal complications of etherization are due less to the anæsthetic than to the careless manner of its administration.

In reference to the *after-effects of ether*, the experience of Fausset $_{\text{June 18}}^{6}$ is of interest: "After-effects of nitrous oxide and ether on the patients operated on at the Chelsea Hospital for Women during the period of a year, in eighty-nine cases, gave no deaths attributable to anæsthetics. Apart from abdominal sections, there have been 68 operations, averaging in duration twenty-three minutes each, the patients averaging 35 years of age, gas and ether, or ether alone, being the anæsthetic used; 21 had no retching or vomiting, and the remaining 47 had each, on an average, not more than 3 attacks of vomiting, with a little retching. There have been 21 abdominal sections, averaging forty-five minutes each, patients' ages 31 years; of these, 18 have the exact number of times they vomited noted, being 44, or two and one-half times for each patient; the remaining 3 were described as "a little," "very slight," and "not violent at intervals for three hours"; 11 had no retching;

and, dividing the remainder into slight and severe, only 2 were noted as having severe retching. About 20 had ether alone, all becoming insensible without coughing, struggling, feeling suffocated, or showing distressing symptoms, the majority being unconscious in three or four minutes. Clover's inhaler, with Hooper's anæsthetic ether, were used, and as little gas and ether given as possible, the muscular relaxation being satisfactory, and the operation commenced in two minutes. Bronchitis was not set up by ether *de novo*, and a few patients who had coughs before operation were not much worse afterward. All complained much for twelve to twenty-four hours of the smell and taste of ether, but not often of headache."

[These remarks were elicited by a discussion before the British Gynæcological Society, in which, in opening this discussion, I pointed out that ether could, if properly administered, be used far more widely in gynæcological surgery than was usual in England. I claim for it (1) greater safety, (2) less struggling, (3) less after-effects, (4) greater rapidity of induction of anæsthesia, (5) equal muscular relaxation, and (6) less shock. The range of its use is determined rather by the skill of the etherist than the condition of the patient. I have successfully used it in obstetrics and hysterectomies, ovariotomies, oöphorectomies, exploratory operations on the pelvis, and other gynæcological procedures.—Ed.]

BROMIDE OF ETHYL.

Ethyl Bromide.—This anæsthetic has recently found many advocates, especially in Germany. Gleich, of Vienna, $\frac{41}{\text{Aug.}}$ records his experience of three hundred cases in Billroth's clinic. The drug (specific gravity of 1.320) was given from an Esmarch mask, covered with tin-foil. Anæsthesia is rapid and evanescent (about three minutes); the face flushes; pulse and respiration are quickened. Adults required 30 grammes (1 ounce); children, 10 grammes ($2\frac{1}{2}$ drachms). Analgesia was found to remain for a time after resumption of consciousness. He considered its use restricted to short operations. He reports one death. The patient suddenly became cyanotic, and the pulse and respiration failed together. The post-mortem showed no hyperæmia of the brain, but fatty degeneration was found in the heart, kidneys, and viscera generally.

Roman von Baracz $\frac{357}{\text{July 15}}$ tried ethyl bromide in two hundred

cases of minor surgery, following Gleich's method, and employing about the same doses. Its use was unaccompanied by sickness; there was little or no excitement. Contra-indications, he states, are: Any operation lasting over five minutes; in cases of reduction of dislocation or fracture, as it does not produce muscular relaxation; in habitual drinkers; in cases in which cardiac, pulmonary, or renal disease exists. Gleich, on the other hand, says it may be used when heart disease is present. Gille, of Cologne, $\frac{4}{\text{No.8,9}}$ asserts that its odor is detectable in the breath of the patient for two or three days after its inhalation. In dental surgery ethyl bromide has found advocates. Haderup, of Copenhagen, $\frac{375}{\text{v.1,No.6,'91}}$ pushes it until snoring occurs, and obtains a narcosis lasting ninety seconds; in some cases he has met with faintness, sickness, headache, but never any dangerous symptoms. The best method of obtaining analgesia is said to be (Lubet-Barbon) to pour a drachm or more upon a mask (Gille's model) and apply it tightly to the face. Absolute exclusion of air is essential. The patient is ready when the eye begins to wander, the body to be slightly relaxed, and the head can be easily moved about (Larremont). If the drug be pushed further, rigidity of the muscles supervenes.

The dangers of ethyl bromide are stated by Brinton $\frac{80}{\text{Apr.15}}$ to be a tendency to arterial hæmorrhage under its use, and extreme muscular rigidity, amounting, in some cases, almost to tetanic spasm. In parturition, Montgomery $\frac{80}{\text{June 15}}$ finds ethyl bromide superior to ether or chloroform. He gives a few inhalations at the commencement of a pain, and the patient, while losing consciousness to pain, is yet able to move the body in obedience to the suggestion of the obstetrician. It should be used at the commencement of the second stage of labor. The same writer, after using it for minor operations in five hundred cases, speaks most favorably of it, both as regards its efficiency and its safety. Chisholm, after an experience of three thousand cases, also commends ethyl bromide. There is a striking want of unanimity in the reports of various surgeons who have employed the drug, for, while some cannot speak in too glowing terms of its value, others regard it as at least as dangerous as chloroform, while it has a narrower range of utility. That the reported deaths under its use have not in all cases been strictly attributable to its use seems incontrovertible, but there certainly exists too much evidence against it at present for it to be

accepted as an accredited anæsthetic; at all events, until we know more about its properties.

PENTAL.

Pental (trimethylethylene), like ethyl bromide, has recently been revived as an anæsthetic, and has enjoyed some encomiums from the profession. Holländer, of Halle, [116 Jan.] has spoken in high praise of its value. He finds that his patients enjoy freedom from pain, without complete loss of consciousness. The condition of anæsthesia, according to Breuer [8 Jan. 21] and Lindner, [8 Jan. 28] appears in one to one and one-half minutes, and true anæsthesia persists for from one to five minutes. They gave pental in one hundred and twenty cases, with one onset of alarming symptoms. The drug was given by being dropped upon a mask, a few drops at a time, the eyes being covered with a compress. There was, as a rule, no excitement, but muscular spasm often appeared; the after-effects are described as slight. These writers, however, add that pental should be used with as much caution as chloroform, and Horatio Wood and Cerna, [805 p. 510] who conducted a research into its physiological action, say, "We are led by our experiments to believe that pental will probably prove a dangerous anæsthetic, and if extensively used will produce death by cardiac arrest." These views find corroboration in some experiments undertaken by Chalalb, who further tried it upon some hospital patients of Assaky's. In several cases anæsthesia could not be obtained. Chalalb [57 No. 9] sums up his views as follows: "Pental, besides giving only a superficial anæsthesia, takes longer in its action than chloroform, and exerts a highly prejudicial effect upon the heart and circulation." Other observers, besides denying that initial excitement is not present, speak of grave symptoms as occurring even in the healthy subject after its use. The quantity used varies from 1 drachm to 1 ounce (4 to 30 grammes), or over.

Pental has also been tried, but without much success, as a local anæsthetic. In general anæsthesia an advantage claimed for it by Holländer, Hägler, and others is, that the condition of semi-consciousness in the patient allows him to open his mouth when required to do so, or in other ways to assist the operator. Pental has been used in dental surgery in England by Constant, [842 May] who believes that, while it is of value in many cases, yet it does not equal nitrous oxide in safety; nor does he recommend its use, save in cases in which nitrous oxide is insufficient or contra-indicated.

LOCAL ANÆSTHESIA.

Cocaine Poisoning.—The experience of the past few years goes to emphasize the danger of cocaine. In a case reported by Warford [199 Aug.] it was used in lieu of chloroform as a preliminary to amputating a breast, with the result that the pulse grew weak (150 to 160), respiration almost failed, and unconsciousness supervened. Reaction was only re-established in an hour. The injection of a 20-per-cent. solution into the tunica vaginalis as a preliminary to the injection of iodine rendered the patient comatose; convulsions followed, and he died finally from syncope. In the case of Berger's patient [67 Mar.15] 1 drachm (4 grammes) of a 1½-per-cent. solution only was injected, yet death resulted. The mitral disease, which was shown to exist by the necropsy, was, according to Berger, in no way responsible for the fatality. There was no communication between the tunica vaginalis and the peritoneum. Labbé had a somewhat similar experience. Other deaths are reported as resulting from injections of weak solutions into mucus-lined cavities.

Germain Sée has collected the particulars of two hundred and sixty serious cases of cocaine toxæmia with twenty-one deaths. He sums up his views as follows: "Cocaine is an untrustworthy and dangerous drug." Lorenz, of Hamburg, [67 Mar.] reports a very grave case following the injection of ⅓ grain (0.022 gramme) into the vaginal portion of the cervix uteri. Polyuria was noticed for four weeks after apparent recovery had taken place. Similarly severe symptoms—unconsciousness, convulsions, syncope—occurred in other cases in which only ⅙ grain (0.011 gramme), and in one case ⅛ grain (0.0081 gramme), had been injected. Polyuria also followed. In the course of an important discussion before the Société de Chirurgie, in Paris, a large experience of the use of cocaine in surgery was quoted, with the result that most of the speakers had one or more grave cases to relate; and Lucas-Championnière expressed his regret that a drug, which he believed was more dangerous than chloroform, should be so commonly, if not recklessly, employed.

Buisseret [136 Nov.15,'91] experimented by using cocaine when removing one tonsil and omitting it for the other, and found that the cocaine materially increased hæmorrhage. Acute mania, fortunately transitory, followed the injection of cocaine in the practice of Krauss.

The patients had both of them suffered from mental trouble previously, but were sane at the time of the injection. Experimenting upon the cause of death in cocaine poisoning, Maurel [67 Mar.] found that it was always the result of destruction of the leucocytes, or at least from injury inflicted upon them. Death is due to saturation or embolism, according as the drug attacks the leucocytes in toxic or non-toxic doses. Maurel believes that the real danger of cocaine depends upon the concentration of the solution used or its accidental entrance into a blood-vessel. Bignon, of Lima, [67 Feb.29] in a research recently published, concludes as follows: "When great excess of acid is present cocaine appears to be inactive, but its power re-appears on neutralizing; and this occurs with both mineral and organic acids. Complete neutralization gives the best result."

Courtin, of Bordeaux, [3 Feb.10] uses cocaine in the following manner: If working upon a cutaneous area, he freezes the skin with an ether spray; if upon a mucous membrane, he paints it with the solution of cocaine for five minutes; and subsequently, in either case, he uses sterilized-wool sponges soaked in cocaine (1 in 30 aq. destill.) for sponging away the blood, and rubs the tissues well over before inserting the sutures. This procedure, it is contended, lessens the absorption, and so minimizes the risk of toxæmia. Schleich [4 No.51] uses cocaine by a process of "infiltration." He first freezes the tissue with ether spray, then introduces an hypodermatic needle parallel to the skin, just beneath the papillary layer, and injects 3 or 4 minims (0.19 to 0.26 gramme) of a solution ($\frac{1}{10}$ grain to 1 ounce—0.0065 to 30 grammes) of cocaine. This is repeated all over the area to be rendered insensitive, and an attempt made to infiltrate the tissues, layer by layer.

Chloride of Ethyl.—In operations lasting for not more than one or two minutes a Monnet (Lyons) glass tube is held over the area to be made insensitive, and the point snapped off. The warmth of the hand causes the chloride to drop out.

Chloride of methyl is also a valuable anæsthetic, and is used from a specially-constructed receiver. In the case of either of these remedies the period of anæsthesia to be relied upon is necessarily very brief.

Iodoform and *carbolic acid* are often overlooked in dealing with the question of local anæsthesia, but both possess valuable analgesic powers.

Tropacocaine (*tropsin*) is a new coca base spoken well of by Chadbourne. [2 Aug.] The most important actions of this body are, that it is less than half as poisonous as cocaine. It is, however, more depressing to the cardiac-motor ganglia. It acts more rapidly as an anæsthetic and its action persists longer; it causes transitory hyperæmia of the tissues; mydriasis is not produced by it; it is slightly antiseptic, and its solution is less liable to change than those of cocaine. Schweigger has used tropacocaine in his eye clinic with some success. A solution of 3 per cent. in a $\frac{3}{5}$-per-cent. solution of sodium chloride is employed for tenotomy and other operations about the eye.

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122. L'Union médicale du Canada, Montreal.
123. Korrespondenzblatt der aerztlichen kreis- und bezirks-Vereine im Königreich Sachsen, Leipzig.
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127. Gazette médicale de Nantes.
128. Medical Era, St. Louis.
129. Dosimetric Medical Review, N. Y.
130. Canada Medical Record, Montreal.
131. Bristol Medico-Chirurgical Journal, Bristol, England.
132. Archives of Gynæcology, New York.
133. Medicinisches Correspondenz-Blatt des württembergischen ärztlichen Landesvereins, Stuttgart.
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142. Gazette médicale de l'Algérie, Algiers.
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144. College and Clinical Record, Philadelphia.
145. Revista de medicina y farmacia, Paris.
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147. Occidental Medical Times, Sacramento.
148. Revue médico-chirurgicale des maladies des femmes, Paris.
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150. Medicinische Monatsschrift, N. Y.
151. Epitome of Medicine, New York.
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154. Gazette de gynécologie, Paris.
155. Denver Medical Times, Denver, Col.
156. Chemist and Druggist, London.
157. Brooklyn Medical Journal, Brooklyn.
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161. Pittsburgh Medical Review, Pittsburgh.
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163. Medical Missionary Record, New York.
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165. Journal de l'anatomie et de la physiologie normales et pathologiques de l'homme et des animaux, Paris.
166. Journal of Mental Science, London.
167. Druggists' Bulletin, Detroit.
168. Gazette médicale de Strasbourg, Strasbourg.
169. Centralblatt für die gesammte Therapie, Vienna.
170. Buffalo Medical and Surgical Journal.
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172. Sanitary Era, New York.
173. Recueil d'ophtalmologie, Paris.
174 Ceylon Medical Journal, Colombo.
175. Nice-médical, Nice.
176. Medical Summary, Philadelphia.
177. Le praticien, Paris.
178. Journal of Physiology, Cambridge, England.
179. Gaceta médica de México.
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181. Bulletin médical du nord, Lille.
182. Archiv für Physiologie, Leipzig.
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184. Revue médicale de l'est, Nancy, France.
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196. Southern Clinic, Richmond, Va.
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198. Progress, Louisville, Ky.
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202. Medical Age, Detroit.
203. La normandie médicale, Rouen.
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205. Centralblatt für allgemeine Gesundheitspflege, Bonn.
206. Indian Medical Gazette, Calcutta.
207. Atlanta Medical and Surgical Journal.
208. Revue scientifique, Paris.
209. Pharmaceutische Zeitschrift für Russland, St. Petersburg.
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213. Glasgow Medical Journal, Glasgow, Scotland.
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215. Studies from the Biological Laboratory of Johns Hopkins University, Baltimore.
216. Albany Medical Annals, Albany, N. Y.
217. Beiträge zur Augenheilkunde, Hamburg.
218. Northern Lancet and Pharmacist, Winnipeg, Manitoba.
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221. Gazette médicale de Montréal.
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223. Bulletin de la Société des médecins et naturalistes de Jassy, Roumania.
224. American Practitioner and News, Louisville, Ky.
225. Le Poitou médical, Poitiers.
226. Archiv f. klinische Chirurgie, Berlin.
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230. Gazette médicale de Picardie, Amiens.
231. Cook County Hospital Reports, Chicago.
232. Gazette médicale d'Orient, Constantinople.
233. Columbus Medical Journal, Columbus, Ohio.
234. American Lancet, Detroit.
235. China Medical Missionary Journal, Shanghai.
236. Archives de tocologie et de gynécologie, Paris.
237. American Journal of Pharmacy, Philadelphia.
238. Chemical News, London.
239. Indian Medical Record, Calcutta.
240. Virchow und Hirsch's Jahresbericht über die Fortschritte der Anatomie und Physiologie, Berlin.
241. Revue de l'hypnotisme et de la psychologie physiologique, Paris.
242. Journal of Nervous and Mental Disease, New York.
243. Archives de médecine et de pharmacie militaires, Paris.
244. L'électrothérapie, Paris.
245. Journal of Cutaneous and Genito-Urinary Diseases, New York.
246. Archiv für die gesammte Physiologie, Bonn.
247. Calcutta Health Journal, Calcutta, India.
248. Journal of Morphology, Boston.
249. Archives of Ophthalmology, New York.
250. Archives de l'anthropologie criminelle et des sciences pénales, Paris.
251. Annals of Hygiene, Philadelphia.
252. Zeitschrift für Medicinalbeamte, Berlin.
253. Journal d'oculistique et de chirurgie, Brussels.
254. Archiv für Augenheilkunde, Wiesbaden.
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257. Canada Lancet, Toronto.
258. Medical Temperance Journal, London.
259. Clinica, Bucharest.
260. American Monthly Microscopical Journal, Washington, D. C.
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262. Annales de l'Institut Pasteur, Paris.
263. American Journal of Psychology, Worcester, Mass.
264. Nursing Record, London.
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268. O correio médico, Lisbon.
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270. L'organe de la confraternité médicale, Bruxelles.
271. Dixie Doctor, Atlanta.
272. South African Medical Journal, Cape Colony, S. A.
273. Archiv für experimentelle Pathologie und Pharmacie, Leipzig.
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278. American Journal of Insanity, Utica, N. Y.
279. Medical Herald, Louisville, Ky.
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281. Medical Advance, Chicago.
282. Montreal Medical Journal, Montreal.
283. Allgemeiner Wiener medizinische Zeitung, Vienna.
284. Maritime Medical News, Halifax, N. S.
285. Australian Medical Journal, Melbourne.
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287. Annales de dermatologie et de syphiligraphy, Paris.
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289. Archives roumaines de médecine et de chirurgie, Paris.
290. La pratique médicale, Paris.
291. Archives de médecine et de chirurgie, Paris.
292. St. Louis Medical Journal.
293. Annalse de la Société médico-chirurgicales, Liége.
294. Bulletin de la phthisie pulmonaire, Paris.
295. Allgemeine Zeitschrift für Psychiatrie und psychisch-gerichtliche Medicin, Berlin.
296. Les nouveaux remèdes, Paris.
297. Allgemeine medicinische Central-Zeitung, Berlin.
298. Gazette hebdomadaire des sciences médicales, Montpellier.
299. Annales de chimie et de physique, Paris.
300. Annales de physiologie, normale et pathologique, Paris.
301. Deutsche Zeitschrift für Chirurgie, Leipzig.
302. Jahrbuch für Morphologie, Leipzig.
303. L'abeille médicale, Paris.
304. La province médicale, Lyons.
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307. L'impartialité médicale, Paris.
308. Journal de la Société de médecine et de pharmacie de la Haute-Vienne, Limoges.
309. Charité-Annalen, Berlin.
310. Jahrbuch für praktische Aerzte, Berlin.
311. Vierteljahresschrift für gerichtliche Medicin und Sanitätswesen, Berlin.
312. Monatshefte für Ohrenheilkunde, Berlin.
313. Monatshefte für Anatomie und Physiologie, Berlin.
314. Zeitschrift für Psychiatrie und gerichtliche Medicin, Berlin.
315. Archiv für Pathologie und Physiologie, Berlin.
316. Anatomischer Anzeiger, Jena.
317. Centralblatt für Gynækologie, Leipzig.
318. Anzeiger über Novitäten und Antiquar der Medicin, Leipzig.
319. Centralblatt für klinische Medicin, Leipzig.
320. Archiv für Anatomie und Physiologie, Berlin.
321. Annales d'orthopédie, Paris.
322. Archiv für Anthropologie, Braunschweig.
323. Mittheilungen aus der ophthalmologischen Klinik in Tübingen.
324. Archiv für Hygiene, Munich.
325. American Analyst, New York.
326. Deutches Archiv für klinische Medicin, Leipzig.
327. Journal des connaissances médicales pratiques et de pharmacologie, Paris.
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330. Médecin clinicien, Paris.
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333. Blätter für Gesundheitspflege, Berlin.
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340. Gazette d'ophtalmologie, Paris.
341. Medizinisch-chirurgisches Centralblatt, Vienna.
342. Journal des sages-femmes, Paris.

343. Monatsblatt für öffentliche Gesundheitspflege, Braunschweig.
344. Zeitschrift für Ohrenheilkunde, Wiesbaden.
345. Annales de thérapeutique médico-chirurgicales, Paris.
346. Annales d'hygiène publique et de médecine légale, Paris.
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354. Der Frauenarzt, Berlin.
355. Revista de terapéutica y farmacia, Madrid.
356. Archives de biologie, Gand.
357. Zeitschrift für Therapie, Vienna.
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359. Journal de pharmacie et de chimie, Paris.
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362. Répertoire de pharmacie, Paris.
363. Gazette hebdomadaire de médecine et de chirurgie, Paris.
364. Medical Fortnightly, St. Louis.
365. Centralblatt für die medicinischen Wissenschaften, Berlin.
366. Jahrbuch für Kinderheilkunde und physische Erziehung, Leipzig.
367. Irrenfreund, Heilbronn.
368. Archiv für Psychiatrie und Nervenkrankheiten, Berlin.
369. Norsk magazin for lægevidenskaben, Christiania.
370. Hygiea, Stockholm.
371. Nordiskt medicinskt arkiv, Stockholm.
372. Lakäreförenings forhändlingar, Upsala.
373. Hospitals-tidende, Copenhagen.
374. Bibliothek for laeger, Copenhagen.
375. Ugeskrift for laeger, Copenhagen.
376. Lo sperimentale, Florence.
377. Gazeta médica de Granada.
378. Gazette médicale de Liége.
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380. Giornale per le levatrici, Milan.
381. Morphologisches Jahrbuch, Leipzig.
382. Wiener Klinik, Vienna.
383. Memorabilien, Heilbronn.
384. Good Health, Battle Creek, Mich.
385. Monatsschrift fur Ohrenheilkunde, Berlin.
386. Deutsche Vierteljahresschrift für öffentliche Gesundheitspflege, Braunschweig.
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389. Bulletin de la Société d'ethnographie, Paris.
390. Deutsches Wochenblatt für Gesundheitspflege und Rettungswesen, Berlin.
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392. Medizinisch-chirurgisches Rundschau, Vienna.
393. Zeitschrift für Gebürtshülfe und Gynækologie, Stuttgart.
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396. Archiv der Pharmacie, Berlin.
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401. Zeitschrift für wissenschaftliche Mikroskopie und für mikroskopische Technik, Braunschweig.
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413. L'Art médical, Paris.
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415. Courrier médical, Paris.
416. L'électricien, Paris.
417. Aerzliches Vereinsblatt für Deutschland, Leipzig.
418. St. Thomas's Hospital Reports, London.
419. Bulletins et mémoires de la Société de chirurgie, Paris.
420. Bulletins et mémoires de la Société médicale des hôpitaux, Paris.
421. Bulletins et mémoires de la Société française d'otologie et de laryngologie, Paris.
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426. Ohio Medical Journal, Cincinnati.
427. Bulletin de la Société de médecine d'Angers.
428. Guy's Hospital Reports, London.
429. Veröffentlichungen des kaiserlichen Gesundheitsamtes, Berlin.
430. Kansas Medical Catalogue, Fort Scott, Kansas.
431. Journal du magnétisme, Paris.
432. Journal of Comparative Medicine and Veterinary Archives, Philadelphia.
433. Concours médical, Paris.
434. Gazette des Eaux, Paris.
435. Revue clinique d'oculistique, Paris.
436. Journal of Heredity, Chicago.
437. Schweizerische Blätter für Gesundheitspflege, Zurich.
438. Gazette française de médecine et de pharmacie, Paris.
439. Revue obstétricale et gynécologique, Paris.
440. The Microscope, Trenton, N. J.
441. Revista de sanidad militar, Madrid.
442. Gazette médicale et pharmaceutique de France.
443. Revue d'hygiène et de police sanitaire, Paris.
444. Pharmacology of the Newer Materia Medica, Detroit.
445. Zeitschrift für Schulgesundheitspflege, Hamburg.
446. Revue speciale de l'antisepsie médicale et chirurgicale, Paris.
447. Revue d'anthropologie, Paris.
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449. Archives d'anatomie pathologique Charcot, Paris.
450. Bulletin de la Société clinique, Paris.
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452. Nouvelle iconographie de la Salpêtrière, Paris.
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455. Bulletin de la Société de médecine de Gand.
456. Revista de ciencias médicas, Barcelona.
457. Archives de médecine expérimentale et d'anatomie pathologique, Paris.
458. Archivio de la Sociedad de Estudios Clinicas, Madrid.
459. Cronica médico-quirúrgica de la Habana.
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461. Archivii italiani di laringologia, Naples.
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501. Bollettino d'oculistica, Florence.
502. Der Naturarzt, Dresden.
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505. Gazzetta degli ospitali, Naples.
506. Journal of the Arkansas Medical Society, Little Rock.
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512. Gyógyászat, Budapest.
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531. Giornale medico del realo esercito e della reala marina, Roma.
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552. Clinique, Chicago.
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556. National Druggist.
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559. Orvosi hetilap, Budapest.
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566 Revista practica de pediatrica, Madrid.
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568. St. Joseph Medical Herald, St. Joseph, Mo.
569. Przeglad lekarski, Krakow.
570. Quarterly Compendium of Medicine, Philadelphia.
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572. Tidsskrift for praktisk medicin, Christiania.
573. Terapeutica medica, Naples.
574. El restaurador farmacéutico, Barcelona.
575. Pharmaceutische Centralhalle für Deutschland, Berlin.
576. Gesundheits-Ingenieur, Munich.
577. Union médicale du nord-est, Reims.
578. Revista médica de Chile, Santiago, Chili.
579. Vereinsblatt der pfaelzischen Aerzte, Frankenthal.
580. Revue sanitaire de la Province, Bordeaux.
581. Pharmaceutical Record, London.
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583. Nederlandsch Tijdschrift voor Geneeskunde, Amsterdam.
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585. Revue scientifique et administrative des médecins des armées de terre et de mer, Paris.
586. Wratsch, St Petersburg.
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589. Riforma medica, Naples.
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591. Rivista sperimentale di freniatria e di medicina legale in relazione con l'antropologia e le scienze giuridiche e sociali, Reggio-Emilia.
592. Zeitschrift für die Behandlung Schwachsinniger und Epileptischer, Dresden.
593. Kjobenhavenske medicinske selskabs förhandlingar, Copenhagen.
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596. Rivista clinica e terapeutica, Naples.
597. Bulletin de la Société médicale de l'Yonne, Auxerre.
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599. L'actualité médicale des sciences médicales et des intérêts professionels, Paris.
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602. American Anthropologist, Washington, D. C.
603. Revue d'anthropologie, Paris.

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605. Archivio di psichiatria, scienze penali ed antropologia criminale, Torino.
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694. Public Health, London.
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802. Lo spallansani, Rome.
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806. Archives of Surgery, London.
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808. International Dental Journal, Philadelphia.
809. Zeitschrift für angewandte Chemie, Berlin.
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812. Biologiska föreningens förhandlingar, Stockholm.
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814. Merck's Bulletin, New York.
815. Sanitary World, London.
816. Bollettino della Società fiorentina d'igiene, Florence.
817. Canada Health Journal, Ottawa.
818. Journal of British and Foreign Health Resorts, London.
819. La terapia moderna, Rome.
820. La medicina popular, Barcelona.
821. Revista médico-quirurgica, Cadiz.
822. Southern Dental Journal, Atlanta.
823. Archivio della riforma medica, Naples.
824. Journal des maladies cutanées et syphilitiques, Paris,
825. Annales des sciences psychiques, Paris.
826. Notes on New Remedies, New York.
827. Le mercredi médical, Paris.
828. Untersuchungen aus dem physiologischen Institut der Universität, Halle.
829. Pharmaceutical Journal of New South Wales.
830. Revista internazionale d'igiene, Naples.
831. Revista de higiene y policia sanitaria, Barcelona.
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848. Mémoires couronnés et autres mémoires publiés par l'Académie royale de médecine de Belgique, Bruxelles.
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857. Annales de la Asistencia Publica, Buenos Ayres.
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866. Review of Insanity and Nervous Disease, Milwaukee, Wis.
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908. Bulletin de la Société de chirurgie, Paris.
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1040. Internationale Beiträge zur wissenschaftliche Medicin.

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1047. Pharmaceutische Centralblatt.
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1055. Indian Medical Reporter, Calcutta.
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1057. Journal d'hygiène populaire, Montreal.
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1060. Climates and Resorts, Chicago.
1061. Archives d'électricité médicale, Bordeaux.
1062. L'Echo des Villes d'eaux.
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1064. The Corpuscle, Chicago.
1065. Florida Medical and Surgical Reporter.
1066. La Revista Médico-Quirúrgica, New York.
1067. The Alkaloid, Chicago.
1068. Tablettes mensuelles de la Société royale de médecine publique de Belgique, Bruxelles.
1069. Condensed Extracts, New York.
1070. Health and Home, Louisville, Ky.
1071. The Philanthropic Index and Review, Kalamazoo, Mich.
1072. Ontario Medical Journal, Toronto.
1073. Journal of State Medicine, London.
1074. Psychiatrische Jahrbücher.
1075. New York Polyclinic.
1076. Am. Jour. of Surg. and Gynæcology.
1077. The Clinical Journal, London.
1078. Yüjno-Rüsskaia Meditzinskaia Gazeta, Odessa.
1079. Sanative Medicine, Westerville, O.
1080. Chicago Clinical Review.
1081. Revista médico-social, Madrid.
1082. Budapester Hygienischer Zeitung.
1083. Revue médicale de la Franche-Comté.
1084. Aerztliche Rundschau.
1085. Archivii ed atti della Sociéta Ital. di Chirurgia.
1086. Medicinsk Revue, Bergen.
1087. Shurnal russkago obschtschestwa ochranenija narodnago sdrawija, St. Petersburg.
1088. Le Midi Médical, Toulouse.
1089. Zeitschrift für Hypnotismus.
1090. Revue Neurologique, Paris.
1091. Leeward Islands Medical Journal.
1092. Indian Medico-Chirurgical Review, Bombay.
1093. Health, Belfast, Ireland.
1094. Boletin del Consejo Superior de Salubridad de Guadalajara.
1095. La Puglia Medica, Bari.
1096. Revue générale de médecine, de chirurgie et d'obstétrique, Paris.

BOOKS, MONOGRAPHS, THESES, ETC.

2000. Sitzungsberichte der K. K. Wiener Akademie der medicinischen Wissenschaften.
2001. Inaugural Dissertation. St. Petersburg.
2002. Thesis. St. Petersburg.
2003. Transactions de la Société Médicale Suédoise.
2004. Transactions de la Société de Médecine de Toulouse.
2005. Les Bactéries. Paris, 1891.
2006. Hammer. The Influence of Light upon the Skin. Berlin, 1892.
2007. Thèse de Paris.
2008. Fehleisen. Die Ætiologie des Erysipels. Berlin, 1883.
2009. Bockhart. Ueber die Ætiologie und Therapie der Impetigo, der Furunkels, und der Sykosis.
2010. Lavergne. Lichen plan aigu. Thèse de Paris, 1882.
2011. Virchow's Festschrift.

2012. Thesis. Genoa.
2013. Transactions of the American Association of Physicians.
2014. Bericht des Jenner'schen Kinderspital. Berne.
2015. Gerhard. Diseases of Children.
2016. Griesinger. Pathologie und Therapie der psychiatrischen Krankheiten. Fünfte Auflage. von Dr. Willibald Levinstein-Schlegel. Berlin: Hirschwald.
2017. Kirchhoff. Lehrbuch der Psychiatrie. Leipzig: Deuticke.
2018. Westphal. Gesammelte Abhandlungen. 2 Bd. Berlin: Hirschwald.
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2020. Pitres. Leçons cliniques sur l'hystérie et l'hypnotisme. Paris: Doin, 1891.
2021. Rassegna clin. e statist. di Salute delle Ville di Palermo.
2022. Mercier. Nervous System and Mind.
2023. Ball. La folie érotique.
2024. Sim. The Case of Alice Mitchell. Memphis.
2025. Tacquet. Contribution à l'étude de l'obliteration des sutures du crâne chez les idiots. Paris.
2026. Laveran. Du paludisme et de son hæmatozoaire. 8vo. 300 pp. Paris: G. Masson, 1891.
2027. Comptes rendus de la Société médicale des Hôpitaux.
2028. Sparmann. Voyage au cap et autour du monde avec le Capitaine Cook. Paris, 1787.
2029. Weinland. An Essay on Tape-Worms of Man. Cambridge, 1858.
2030. Proceedings of the Academy of Natural Sciences of Philadelphia.
2031. Bulletin of the United States Fish Commission.
2032. Annual Report of the U. S. Marine-Hospital Service.
2033. Magalhaes. Filariosis de Wucherer e do respectivo parasita adulto, a Filario Bancrofti-Cobbold ou Filaria Sanguinis hominis Lewis. Rio Janeiro, 1887.
2034. Atti Soc. Toscan. Sc. Natur. Pisa.
2035. Frankfurte Zeitung.
2036. Foster. Text-Book of Physiology.
2037. Proceedings American Pharmaceutical Association.
2038. Scientific American.
2039. Publications of U. S. Department of Agriculture, Division of Entomology. Washington, D. C.
2040. Beard. Spinal Concussion.
2041. Proceedings Twentieth Congress German Surgical Society.
2042. Comptes rendus de la Société de Chirurgie. Paris.
2043. Arbeiten aus dem chirurgischen Univ. Poliklinik zu Leipzig.
2044. Vignard. De la prostatectomie.
2045. Keith's Perineal Lithotrite. Made by Coxeter & Son, London.
2046. Malécot's *sonde à demeure.* Made by Eynard, Paris.
2047. Norton's Prostatome. Made by J. Weiss & Son, London.
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2049. Transactions of the American Otological Society.
2050. Separat Abdruck aus der Monatsschrift für Ohrenheilkunde.
2051. Transactions of the London Medical Society.
2052. Alcohol and its Treatment. 1892.
2053. Kerr. Inebriety; its Etiology, Pathology, Jurisprudence, and Treatment. London, 1889.
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2055. Comptes Rendus. Vol. cxv, p. 101.
2056. Annales de la Société Royale de Médecine de Bruxelles. Vol. i, 1892.
2057. Med. Selskabs Forhändlinger. 1891, 1892.
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2062. Baruch. The Uses of Water in Modern Medicine. Detroit: Geo. S. Davis.
2063. Kondyreff. The Mineral Waters and Mud Baths of Slavjanski. 70 pp. St. Petersburg: A. V. Pojaroff, 1891.

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2067. Transactions British Medical Association.
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2078. Kyle. The Pathology and Treatment of Tetanus. Philadelphia.
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2082. Century Magazine.
2083. Sir Joseph Fayrer. Thanatophidia of India.
2084. Wall. Indian Snake-Poisons.
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2086. Transactions of the Royal Society of Queensland.
2087. Congress at Saratoga.
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2089. Fournier. Recurrent Pseudo-Chancres.
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2092. Lancereaux. Leçons cliniques.
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2094. Sappey. Des Vaisseaux lymphatiques.
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2101. Hoffa. Lehrbuch der orthopædischen Chirurgie.
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2103. Hartwig's Pleural Trocar. Made by Stoddard Brothers, Buffalo, N. Y.
2104. Philadelphia Hospital Reports.
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2107. Atti d. Accad. de Scienze. Torino.
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2111. Raichline. Contribution à l'étude de la Syringomyélie. Paris.
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2140. Proust. La défense de l'Europe contre le Choléra. Paris.
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2145. Atti e rendiconti accad. d. med. Genoa.
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2149. Rajasingham's Trephine. Made by J. Gardner & Son, Edinburgh.
2150. John Martin. Graduation Thesis, Victoria University.
2151. Avelino Barrena. Conducta del Tocologo en los casos de retencion placentaire.
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2154. Audry. Sur l'athétose double et les chorées chroniques de l'enfance.
2155. Nina Rodriguez. Fragmentos de pathologia intertropical. Bahia, 1892.
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2157. C. Porak and R. Bogdan. Traitement des ruptures utérines. Jassy.
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2159. Spinelli. I resultati della sinfisiotomia antisettica presse la scuola ostetrica di Napoli.
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2162. Transactions Illinois State Medical Society.
2163. Carlier. Mémoire de la Société d'anthropologie. Paris.
2164. Bull. du Comité agric. du Département de l'Aube, France.
2165. Report of the New Jersey State Dairy Commission: The Preservation of Milk.
2166. Butlin. The Operative Surgery of Malignant Disease. London.
2167. Martin. Immediate Prothesis in Resection of the Maxillaries. Paris: Masson.
2168. Matti Äyräpää. Die orthopædische Behandlung der Sattelnase mittelst von der Zahnheilkunde gebotenen Hülfsmitteln. Knopiv, Finland: O. W. Backman.
2169. Hooks for Removal of Gasserian Ganglion. Made by Hawksley, London.
2170. Proceedings of the Royal Society of Edinburgh.
2171. Scientific American.
2172. Levasseur. La population française.
2173. Rapport adressé au Ministre sur le mouvement de la population française en 1890.

2174. Dumont. Dépopulation et civilisation.
2175. Tabelvörk til Kobenhavns Statistik.
2176. Globus. Mortality of French Soldiers in the Colonies.
2177. Parke. Experiences in Equatorial Africa. London.
2178. Dictionnaire encyclopédique des Sciences Médicales.
2179. Eddes and Thomson. Evolution of Sex.
2180. Strahan. Marriage and Disease.
2181. Ogteskabsstatistik. Copenhagen.
2182. Allgemeines statistiches Archiv.
2183. Ehrenzweig's Asse ranz Jahrbuch.
2184. Howard Collins. Diminution of the Jaws in Civilized Races. London.
2185. Münchener Med. Abhandlungen.
2186. Preussische Statistik.
2187. Kaiserliche Gesundheitsamte.
2188. Testut. Les Anomalies Musculaires considérées au point de vue de la Ligature des Artères. Paris: O. Doin.
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2190. Wood's Medical and Surgical Monographs.
2191. Goelet. Electricity and the Curette in the Treatment of Hæmorrhage accompanying Uterine Fibroids.
2192. Mémoires de la Société d'anthropologie de Paris.
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"Tabloids"—*continued.*

grs, 100 in bottle. Ammon. Chloride, 3 grs, 30 and 100 in bottle; 5 grs, 100 in bottle; 10 grs, 100 in bottle. Ammon. Chlor. with Borax, 100 in bottle. Antacid Calcium Carb. Præcip, 3 1/2 gr; Magnes. Carb. 2 1/2 gr; Sodium Chloride 1 gr, 25 and 100 in bot. Anti-Constipation (Aloin, 1/5 gr; Belladonna Ex., 1/8 gr; Strych., 1/60 gr; Ipecac., 1/16 gr), 50 in bottle. Antifebrin, 2 gr. 25 and 100 in bottle. Antim. Tartrate, 1/50 gr, 100 in bottle. Antiprin, 5 gr, 25 and 100 in bottle. Apomorphine Mur., 1/50 gr, 50 in bottle. Arsenious Acid, 1/100 and 1/50 gr, 100 in bottle. Atropin Sulph., 1/100 gr, 50 in bottle. Belladonna. Tinc., 1 min, 100 in bottle. Bismuth Sub-nit. 5 gr, 25 and 100 in bottle; 10 gr. 100 in bottle. Blue Pill, 3 gr. 25 and 100 in bottle. Borax, 5 gr, Calcium Sulph., 1/10 gr, 100 in bott. Caffeine Citrate, 2 gr, 100 in bott. Calomel, 1/2 and 1 gr, 100 in bott. Capsicum Tinct, 1 min, 100 in bott Cascara Sagrada Ext., 2 gr, 25 and 100 in bott. Cascara Compound (Cascara Dry Ext., 1 gr, Euonymin, 1/2 gr; Hyoscyamus Dry Ext., 1/3 gr; Nux Vomica Ext., 1/16 gr), 24 and 100 in bott. Cathartic Comp., U.S.P. Ext. Coloc. Co. Pulv, 1 1/3 gr; Ext. Jalapæ Pulv., 1 gr; Hyd. Subchlor, 1 gr, Cambogiæ Pulv., 1/4 gr, 24 and 100 in bottle. Charcoal 5 gr, in oval bottles containing 25 and 100. Chloral Hydrate, 5 gr, 100 in bottle. Chloral-Amid 5 gr, 100 in bott. Cocain, 1 gr; Cocain, with Potash and Borax (*see* Voice.) Cretæ Aromatic, c Opio. Pulv., 5gr., in bottles of 25 and 100. Digitalis Tinct., 1 min, 100 in bott. Digitalin, 1/100 gr, 50 in bott, Diuretin (Knoll), 5 gr, 25 and 100 in bott; Dorer's Powder (*see* Ipecac. Opio.) Euonymin Resin, 1/8 gr, 50 in bott; Exalgin, 2 gr, 100 in bott. Ferrum redactum (*see* Reduced Iron); Gregory's Powder (*see* Rhubarb Comp. Pulv.) Hydrarg. Cretâ, 1/3 gr, 100 in bott. Hydrarg. Iod Rubr., 1/20 gr, 50 in bottle; Hydrarg. Iod. Vir. 1/8 gr, in bottle. Hydrarg, Perchlor. 1/100 gr, 100 in bott. Hydrastia Comp. (Hydrastia Mur., 1/4 gr; Ergotin, 1/2 gr; Cannabin Tannate, 1/2 gr), each tabloid, 100 in bottle. Ipecac. and Opium (Dover's Powder), 5 gr, 24 and 100 in bott; 1/4 gr, 100 in bott. Ipecac. Powder, 5 gr, 100 in bott; 1/10 gr, 100 in bott. Iron and Arsenic Comp.

"Tabloids"—*continued.*

(Quinine Bisulph, 1 gr; Iron Hypophosp.,2 gr; Arsenic, Strychniœ Sulph. ãã, 1/50 gr), 100 in bott. Iron and Quinine Cit., 3 gr, 25 and 100 in bott. Laxative Vegetable, 25 and 100 in bottle; Lithia Carbonate, 2 gr, 100 in bott. Manganese Dioxide, 2 gr, 25 and 100; Morphia Sulph. 1/20 and 1/8 gr, 50 in bottle each. Nitroglycerine, 25 in bott (*see* also Trinitrine). Nux Vomica Tr., 1 min, 100 in bott. Opium Tinct, 2 mins, 50 in bott; Pancreatin (*see* Zymine "Tabloids." Papain (Finkler), 2 gr, 25 and 100 in bot Pepsin Tabloids (Fairchild), 25 and 100 in bott. Pepsin saccharated, 5 gr, 100 in bot. Peptonic 3 gr, 25 and 100 in bott. Phenacetin, 5 gr, 25 and 100 in bottle. Pilocarpin Mur, 1/20 gr, 50 in bot Podophyllin Resin, 1/4 gr, 100 in bott. Potash Bicarb, 5 gr, 40 and 100 in bott. Potass. Bromide 5 and 10 gr, 100 in bott. Potash Chlorate, 5 gr, 40 and 100 in box Vinaigrette style. Potash Chlor. with Borax, 40 and 100 in box, Vinaigrette style, 40 and 100 in bott. Potass, Iodide, 5 gr, 100 in bott. Potash Nit. (*Sal Prun.*), 5 gr, 100 in bott. Potass. Permanganate, 1 gr, 100 in bott; 2 gr, 100 in bottle. Quinine Bisulphate, 1/2 gr, 50 and 100 in bott 1 gr, 36 and 100 in bott; 2 gr, 24 and 100 in bott; 3 gr, 24 and 100 in bott; 5 gr, 24 and 100 in bott. Reduced Iron, 2 gr, 100 in bott. Rhubarb Comp. (Pill) 3 gr (Rhei. Pulv. 1 1/4 gr, Aloes, Soc. Pulv. 1 gr, Saponis, Pulv. 5/8 gr. Myrrhæ, Pulv., 5/8 gr. Ol Menth, Pip.). 24 and 100 in bott Rhubarb Comp. Pulv, 5 gr (Gregory Powder) 24 and 100 in bott Rhubarb and Soda, 5 gr (Rhei. 3 grs, Soda, 2 gr, Zingiber, 1/2 gr), 24 and 100 in bott. Rhubarb, 3 gr,24 and 100 in bott. Saccharin, 1/2 gr, 100 and 200 in oval bottle. Salicin, 5 gr, 25 and 100 in bott Salol, 5 gr, 25 and 100 in bottle Santonin, 1/2 gr, 50 in bott. Soda Bicarbonate, 5 gr, 40 and 100 in bott. Soda-Mint or Neutralising Tabloids (Soda Bicarb., 4 gr, Ammon. Carb. 1/2 gr, Ol Menth. Pip. 1/4 gr), 30 and 100 in bott. Soda Salicylate, 3 gr, 100 in bottle. Strophanthus (2 mins. of tincture in each) 50 and 100 in bott. Sulphonal, 5 gr, 25 and 100 in bott. Sulph. Comp., Sir A. Garrod's formula (Sulph. Præcip., 5 grs, Potass. Bitart., 1 gr), 25 and 100 in bott. Test "Tabloids" for preparing Fehling's Solution.

"Tabloids"—*continued.*

Tannin, 2 1/2 gr, 100 in bott. Thir 25 and 100 in bott. Tonic Com (Iron Pyrophos., 2 gr, Quinine 1 gr, Strychnine 1/100 gr), 25 a 100 in bott. Trinitrine (Nitr glycerine), 1/100 gr, 25 and 1 in bottle, 7d and 1s 6d each; 1/ gr, 25 and 100 in bott, 7d and 1 each. Trinitrine and Amyl N. rite, 25 and 100 in bott, 1s. ar 3s. each. Trinitrine Comp. (Tri itrine, 1/100 gr, Nitrite Amyl, gr, Capsicum, 1/50 gr, Mentho 1/50 gr), 25 and 100 in bottl Urethane, 5 gr, 25 and 100 i botts. Voice (Potash, Borax an Cocain), 30 and 80 in boxes, i oval botts. of 30 each. Wa burgh's Tincture (30 mins. eac 100 in bott. Zinci. Sulph., 1 g 100 in bott; Zinci. Sulpho. Carbo late, 2 gr, 100 in bott. Zymin (Fairchild), 25 and 100 in bottle Zymine Compound (Fairchild)– Zymine, 2 gr; Bismuth Sub-nit 3 gr; Pulv. Ipecac., 1/10 gr i each "Tabloid," 25 and 100 i bottle.

Tampons, Vaginal (B. W. & Co.) Eucalyptia, Iodine, Iodised Phenol, Belladonna, etc.

Terebene, Pure (B. W. & Co.), 1 oz, 2 ozs, 8 ozs and 16 oz botts.

Tincture, Press (B. W. & Co.), in two sizes. The smaller size is made especially for pressing small fruit; the smaller is not so strong or so serviceable as the larger (or regular) size, and we do not recommend it.

Traveller's Medical and Surgical Guide.

Urinary Test Case (B. W. & Co.) contains "Tabloids" for preparing Fehling's Test Solution, Urinometer, 6 Test Tubes Graduated Glass, 3 Stoppered Bottles for Acid, Spirit Lamp, Test Papers, etc., etc.

Universal Perfect Purifier (*see* Jeye's Sanitary Fluids.)

Vaginal Tampons (*see* Artificial Sponges.)

"Valoid" Fluid Extracts (or part extract equals one pa drug.) We make "Valoids" of nearly all the drugs in modern use, and will be glad to quote for any quantity. These "Valoids" are scientifically prepared, represent the fullest strength of the drug, are elegant preparations, and thoroughly reliable.

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